COUNSELING ADULTS TO CHOOSE A HEART HEALTHY DIET TO APPROPRIATELY MANAGE HYPERTENSION IN A LOCAL AMBULATORY CLINIC IN TUCSON, ARIZONA

by

John Bryan Sarmiento Serrano

A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

THE UNIVERSITY OF ARIZONA

2 0 1 9

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the DNP Project Committee, we certify that we have read the DNP project prepared by John Bryan Sarmiento Serrano, titled Counseling Adults to Choose a Heart Healthy Diet to Appropriately Manage Hypertension in a Local Ambulatory Clinic in Tucson, Arizona and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

Christy L Pacheco
_____ Date: Oct 25, 2019
Christy L. Pacheco, DNP, FNP-C

Patricia A. Mackey
_____ Date: Oct 25, 2019
Patricia A. Mackey, DNP, FNP-BC, BC-ADM, CDE

Elizabeth Knight
_____ Date: Oct 26, 2019
Elizabeth D. Knight, DNP, FNP-C

Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

Christy L Pacheco
_____ Date: Oct 25, 2019
Christy L. Pacheco, DNP, FNP-C
DNP Project Committee Chair
College of Nursing

ACKNOWLEDGMENTS

This author would like to acknowledge Christy Pacheco, DNP, FNP-BC, who had been there in the beginning, and who had guided, mentored, and advocated for the author throughout the program, Patricia Mackey, DNP, FNP-BC, BC-ADM, CDE, and Elizabeth D. Knight, DNP, FNP-C for their time, hard work, and effort to help complete the finish product of this project. The energy and time that they committed to refine and complete this DNP project was very much appreciated. This project would not have been possible without their tremendous help.

DEDICATION

This is dedicated to my mother who inspired me to become a healthcare provider, give back the blessings bestowed upon me, and offer the commitment and hard work to care for those who need medical help.

TABLE OF CONTENTS

TABLE OF CONTENTS – *Continued*

TABLE OF CONTENTS – *Continued*

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Background: Hypertension continues to plague United States (U.S.) adult population, and at southwest local city of Tucson, Arizona. A brief educational intervention along with a dietary intervention prescription template were used to implement a quality improvement (QI) project to improve patient care and bring awareness of this issue in a Tucson, Arizona local primary care clinic.

Purpose: The purpose of this QI project was to (1) improve provider knowledge on the affects of diet on patients' blood pressures, and to use the DASH Diet prescription for patient counseling, (2) increase providers' intent to prescribe the dietary prescription, and (3) evaluate satisfaction with the content and delivery of this educational intervention.

Methods: A single group, quasi-experimental pre-test/post-test comparison study was used at the local primary care clinic of Carondelet Medical Group-Central. All of the primary care providers (n=15) in this clinic were invited to become participants in this QI project. *Intervention:* The project's intervention consisted of a 15-minute brief educational intervention that used the Power Point platform, and covered the current hypertension guidelines and best evidence on the DASH Diet being the most effective dietary intervention in controlling adult blood pressures, along with the presentation of the dietary intervention prescription template based on the DASH Diet recommendations. The participants completed the pre-test survey before the intervention and the post-test survey after. The surveys' responses were used in the data analysis of the QI project, and used descriptive statistics mean, median, and mode to determine the central tendency of all the participants.

Results: There were 12 participants who attended the entire educational brief, 12 pre-tests were completed, and 11 post-tests were returned. Medical doctors (n=6), advanced practice nurses (n=4), and physician assistants (n=2) consisted the sample population, and they all had a variety of years of experience (>=8 years, n=9; <1 year, n=2; 1-3 years, n=1). Knowledge based on the DASH Diet, knowledge on DASH Diet guidelines, prescribing habits of dietary interventions, and the perception of dietary intervention were the main outcome measures. The pre-test and post-test comparison yielded all positive change in percentage for all the outcome measures. The results were Knowledge mean 43%+, median 43%+, mode 57%+; Dash Diet guideline mean 19%+, median 33%+, mode 57%+; Prescribing of dietary intervention habits 44%+, 67%+, 67%+; and Perception of dietary intervention mean 16%+, median 25%+, mode 50%+.

Conclusion: At this local primary care clinic, a brief educational presentation and the dietary interventional prescription were deemed effective and satisfactory in improving provider knowledge on the effects of diet on patients' blood pressures, and to use the DASH Diet prescription for patient counseling in their future practice habits, and it increased providers' intention to prescribe the dietary prescription.

INTRODUCTION

The leading cause of death in the United States (US) is cardiac disease caused by ischemic cardiac and stroke events, and hypertension is the main risk factor that allows these diseases to develop (Murphy, Kochanek, Xu, & Arias, 2015; Chobanian et al., 2003; Yoon et al., 2014). More adult lives will be taken if blood pressures continue to be poorly managed, leading to the development of hypertension. Hypertension also contributes to poor quality of life, and it is costing the US billions of dollars treating cardiovascular diseases (Mozaffarian et al., 2016). This quality improvement project aims to provide a solution to better manage adult blood pressures and stop the development of cardiovascular diseases. The focus of this project was to improve the dietary prescription practices of healthcare providers at a local primary care clinic by implementing a brief educational intervention on the benefits dietary changes effects on adult blood pressures and how to prescribe an evidence-based dietary eating pattern that was effective against the development of hypertension. In addition to the presentation, the providers were given access to the dietary prescription template electronically (giving them the option to print it out for hard copy use or send them electronically to patients and colleagues) to be used to counsel patients that used this evidence-based dietary eating pattern. Data on the effectiveness of and providers' perception with this intervention was analyzed, and assessed its use for the future. This report described the following: the background and scientific knowledge base, the project's purpose and aims, a theoretical framework that guide the project, a synthesis of current evidence, the methods of the project, ethical considerations, discussion, and conclusion with future recommendations.

Background

Hypertension is defined as the following according to *American College of Cardiology and American Heart Association Task Force on Clinical Practice Guidelines* on high blood pressure in adults that was recently revised on November of 2017, defines all different levels of hypertension. Normal BP is defined as <120 mmHg SBP and <80 mmHg DBP. Elevated BP is now 120-129 mmHg SBP and <80 mmHg DBP (Whelton et al., 2018). Stage 1 hypertension is defined as an SBP of 130–139 or a DBP of 80–89 mm Hg, and stage 2 hypertension is ≥140 mm Hg SBP or ≥90 mm Hg DBP (Whelton et al., 2018).

Prevalence

The prevalence of hypertension in adults 18 years old and older globally is approximately 1.4 billion adults, or 31% of all population, and it is 72.2 million adults, or 31.9% in the US (Carey, Muntner, Bosworth, & Whelton, 2018). This means that for every three adults, one has hypertension, and of those who have hypertension, only 50% have their blood pressure under control (Yoon, Fryar, & Carroll, 2015).

Consequences

It is critical that hypertension is controlled and even prevented, because it leads to cardiovascular consequences, such as heart attacks, strokes, kidney injuries and diseases, and other cardiovascular diseases that not only take lives away, but it also significantly decrease quality of life (Yoon et al., 2014). Hypertension is one of the leading controllable risk factors for cardiac disease (Yoon, Fryar, & Carroll, 2015; ODPHP, 2019), meaning that with lifestyle modifications, hypertension can be controlled and even prevented (Ritchey, Wall, Gillespie, George, & Jamal, 2014).

The number one cause for the development of cardiovascular diseases, including ischemic cardiac and stroke diseases, kidney injuries and chronic kidney diseases, heart failure, cerebral small vessel disease that leads to dementia, and other cardiovascular diseases is hypertension (Carey, Muntner, Bosworth, & Whelton 2018). The severity of hypertension impacts these risks. For each 20 mmHg SBP increases or 10 mmHg DBP increases is associated with doubling the risk of suffering a death from any cardiovascular disease events (Lewington et al., 2002). This is a major financial burden for patients with the most recent figures reported that the US today spends $320 billion in healthcare annually on cardiovascular diseases, which hypertension is a major contributor (Mozaffarian et al., 2016).

Evidence-Based Recommendations

The two clinical practice guidelines on hypertension management that are widely used in the US are the 2017 American College of Cardiology and American Heart Association Task Force on Clinical Practice Guidelines (ACC/AHA), and the 2014 Eighth Joint National Committee (JNC 8) (Whelton et al., 2018; James et al., 2014). According to these two guidelines, hypertension management includes pharmacological and non-pharmacological approaches to appropriately manage hypertension (Whelton et al., 2018; James et al., 2014). Both guidelines recommends incorporating lifestyle modification of eating a healthier diet, specifically a low sodium diet known as the Dietary Approach to Stop Hypertension (DASH diet), and the focus of this report will be recommending this heart healthy diet to appropriately manage and even prevent the development of hypertension (Whelton et al., 2018; James et al., 2014). This project will focus on the non-pharmacological recommendations, specifically use evidence-based research studies to identify proper food selections that will manage blood

pressure better, improve uncontrolled blood pressure, and prevent cardiovascular consequences. The DASH diet is cited as the dietary recommendation that is backed by ACC/AHA Hypertension Guideline and the Eight Joint National Committee guidelines as an effective diet to lower and control blood pressures (Whelton et al., 2018; James et al., 2014) in pre- and hypertensive patients (see Synthesis of Evidence for supporting evidence).

To mobilize patients to adhere to a heart healthy diet, it is important for patients to receive nutritional counseling and guidance about foods that will lower blood pressure (BP). However, there are a couple of barriers that this report focused on. One barrier was the lack of educational training that providers receive during their academic years about proper diet management (Aspry et al., 2018). According to *National Academy of Sciences* survey in 2013, healthcare academic schools and universities provide only 17 to 19 hours credit hours about nutrition management to their students, making current providers having inadequate knowledge to appropriately provide heart healthy diet counseling (Aspry et al., 2018). Another barrier to focus on was the difficulty of patients effectively learning information given to them at their primary care provider's office, and this is critical since lifestyle modification of changing their diet depends on their understanding during their patient education counseling. According to Carey, Muntner, Bosworth, and Whelton, (2018) of *Journal of the American College of Cardiology*, the effectiveness of patient education is dependent on social determinants, such as level of education, economic status, employment status, and access to healthcare.

These factors were involved in the difficulty of patients understanding the information being counseled to them by their primary care providers. The purpose of this project was to implement an evidence-based educational tool for providers to use to readily counsel their adult

patients on which diet to choose to encourage changing their diet to a heart healthy diet in order to appropriately manage their blood pressure. This initiative facilitated patient education for providers to counsel their patients, including tailoring specific recommendations for their patients, while also making it easy for patients to understand what specific dietary recommendations they should incorporate to reduce their blood pressure and cardiovascular risk.

Physiology of Hypertension

Cardiovascular pressure is maintained by the arterial blood pressure that is essential to provide adequate supply of blood to tissue organs throughout the body (McCance & Huether, 2014; LeMone & Burke, 2008). Generally, blood circulates from high to low pressure, and the pressure created by blood flow against arterial walls is the blood pressure (LeMone & Burke, 2008). The high pressure is the cardiac output that is created from arterial system ejecting blood from the heart during systole (contracting and pumping of blood by the heart) with systemic vascular resistance created from the elastic walls of the arteries (McCance & Huether, 2014; LeMone & Burke, 2008). To simplify, this is expressed as cardiac output x systemic vascular resistance = blood pressure (McCance & Huether, 2014; LeMone & Burke, 2008).

Blood pressure changes occur depending on the thickness of the blood, and the length of the vessels as the constant factors, as well as how different systems work in the body (McCance & Huether, 2014; LeMone & Burke, 2008). One system is the sympathetic nervous system, and it works by sensing mean arterial pressure (MAP) changes by the baroreceptors in the carotid sinus and aortic arch, which responds to either increasing cardiac output and heart rate to vasoconstrict arteries, or decreasing cardiac output and heart rate to cause vasodilator arteries (McCance & Huether, 2014; LeMone & Burke, 2008; Carey, Muntner, Bosworth, & Whelton

2018). The release of norepinephrine and epinephrine also acts in similar ways, like during flight or flight response (LeMone & Burke, 2008).

The renin-angiotensin-aldosterone system increases blood pressure by sensing a drop of kidney perfusion, releasing renin, converting angiotensin I to II, and potently vasoconstricts, while the release of aldosterone also retains sodium and water to help increase blood pressure (LeMone & Burke, 2008; Carey, Muntner, Bosworth, & Whelton 2018). Vasopressin also causes vasoconstriction and water retention in order to increase blood pressure (LeMone & Burke, 2008).

Arterial cells can also release brain and atrial natriuretic peptide when arterial walls are stretched excessively by volume of blood, and generally react by decreasing blood pressure (McCance & Huether, 2014; LeMone & Burke, 2008; Carey, Muntner, Bosworth, & Whelton 2018). Blood pressure regulation is a complex system, and the factors listed above are a few of the major explanations on how blood pressure is regulated in order for the body to bring blood to all essential components.

Hypertension is when blood pressure readings are within the parameters listed above. This occurs when blood pressure regulators and factors over or under perform brought upon from risk factors (LeMone & Burke, 2008). Hypertension is considered the leading modifiable risk factors because many of the factors that contribute to developing hypertension can be controlled (Yoon, Fryar, & Carroll, 2015; ODPHP, 2019). Such modifiable risk factors are being physically inactive, excessive amount of sodium intake, excessive alcohol intake, and poor weight management that lead to becoming obese (McCance & Huether, 2014; LeMone & Burke, 2008; Carey, Muntner, Bosworth, & Whelton 2018). There are also non-modifiable risk factors such as

age, family history, and race (McCance & Huether, 2014; LeMone & Burke, 2008), but hypertension can still be controlled under these risk factors. This report will generally focus on decreasing blood pressure from reducing sodium intake.

Sodium and water balance is essential to maintain for proper body homeostasis. The two go hand in hand, because, generally speaking, water follows the concentration of sodium (McCance & Huether, 2014). Sodium, the positively charged ion, accounts for 90% of all positive ions in the extracellular fluid, and it manages the water balance with its negatively charged ions, bicarbonate and chloride, by controlling the extracellular osmotic forces, and ultimately seeing the interaction of water following sodium (McCance & Huether, 2014). Positively charged ion sodium has 142 mEq/L in the extracellular fluid, which is balanced with negatively charged ion of chloride (104 mEq/L) and bicarbonate (24 mEq/L), and since there are more sodium than chloride and bicarbonate, water will follow the concentration of sodium.

This concept is related to hypertension because when there is an increase in sodium intake of more than 2,300 mg of the recommended daily allowance (Jackson, King, Zhao, & Cogswell, 2016), volume levels in the body will increase, and ultimately increasing the body's blood pressure to put people at risk of developing hypertension. Add the process to the blood pressure regulation systems that increases blood pressure mentioned above, and it will overwhelm those systems and contribute to the development of both acute and chronic hypertension diseases.

Managing a low sodium diet to lower blood pressure, prevent, and manage hypertension intervention was confirmed effective based on the *Effects on blood pressure of reduced dietary sodium and the dietary approaches to stop hypertension* study published in *The New England*

Journal of Medicine in 2001. The study reported that in over 412 sample members of male and female adults of 18 years old and older with mixed race (Blacks, Whites, Asians or other) with and without hypertension, consuming a low sodium diet resulted in a blood pressure reduction of 7.1 mmHg SBP for those who do not have hypertension, and blood pressure reduction of 11.5 mmHg SBP to those who do have hypertension (Sacks et al., 2001). The low sodium diet that was deemed the most effective was the Dietary Approaches to Stop Hypertension (DASH) diet, which consist of fruits, vegetables, whole grains, low-fat dairy products, fish, poultry, and nuts, along with small amounts of sweets, red meat, sugary drinks, and reduced amounts of total cholesterol and saturated fats (Sacks et al., 2001). This diet was so effective that it is now part of the two cardiovascular and hypertension national clinical practice guidelines (Sacks et al., 2001).

Lifestyle Modification

Nutritional changes to patient's diet are an effective life style modification to treat, and control hypertension (Ritchey, Wall, Gillespie, George, & Jamal, 2014; ODPHP, 2019). Specifically, the nutritional change that needs to be made is for patients to consume a low sodium diet. Institute of Medicine (2004) reported that high amount of sodium intake from selected foods increases the internal body's blood pressure, which increases developing cardiovascular diseases, strokes, and other heart disease consequences. Most recent data shows that 90% of the US population exceeds the recommended daily allowance of 2,300 mg of dietary sodium intake (Jackson, King, Zhao, & Cogswell, 2016), hence, it is important to implement proper patient education to patients who are at risk or who have hypertension.

Supporting evidence. The *Introduction* and the *Background*, as well as the *Synthesis of Evidence* provided the support to carry out this project at this clinic. The purpose of the

intervention assessed the knowledge level of the providers about the DASH diet. In the section Synthesis of Evidence, an overwhelming studies supported that the DASH diet was a very effective non-pharmacologic eating pattern that would improve the management of blood pressure and prevent cardiovascular consequences, as evidenced by multiple studies cited SBP reduction range between of 1.17mmHg SBP up to 14.3mmHg SBP (Ndanuko et al., 2016; Gay et al., 2016; Lima et al., 2013; Juraschek, Miller, Weaver, & Appel, 2017; Lin et al., 2013; Kucharska et al., 2018; Saneei et al., 2014; Epstein et al., 2012; O'Connor et al., 2018; Salehi-Abargouei et al., 2013).

The 2017 American College of Cardiology and American Heart Association Task Force on Clinical Practice Guidelines (ACC/AHA), and the 2014 Eighth Joint National Committee (JNC 8) (Whelton et al., 2018; James et al., 2014;) also cited that DASH diet is the dietary eating pattern to better improve the management of blood pressure amongst pre and hypertensive patient. It is this evidence that supports the creation of the dietary prescription that consist of the DASH diet, and it will be presented to the providers as the main intervention presentation.

It was important to have assessed the knowledge level of the providers in this QI project in order to effectively counsel and coach their patients to a better blood pressure control using the DASH diet and the interventional dietary prescription. The presentation to the providers closed the gap of knowledge deficit about the specifics on the DASH diet, while also provided background information about blood pressure and presented the supporting evidence used in this paper. The comparison between pre-test and post-test determined how much the providers learned about the DASH diet before the presentation and after.

Implementing the DASH Diet

The DASH Diet was implemented using the dietary prescription. The providers served as the patients' counselors or coach that encourages them to learn about this eating pattern and engaged them in changing their eating behavior to better controlled their blood pressures (Lima et al., 2013; Juraschek, Miller, Weaver, & Appel, 2017; Lin et al., 2013; Kucharska et al., 2018; Epstein et al., 2012; O'Connor et al., 2018). The DASH diet consisted of the following nutrients and their designated target servings: 2100 total calories consumed daily; sodium of 1500 to 2400mg daily; potassium of 4700mg; calcium of 1240mg; magnesium of 500mg; total fat % of calories of 27%; saturated fat % of calories of 6; cholesterol of 150mg; fiber of 31g; and protein % of calories of 18% (Lin et al., 2013; Juraschek, Miller, Weaver, & Appel, 2017). In addition, the importance of this project will be the presentation of this dietary prescription to the providers. By the providers having had received the project's presentation, they had the opportunity to learn more in detail about the DASH diet. It bridged knowledge gaps of providers about the DASH diet, the background and science behind blood pressure effects from sodium and water, and the supporting best evidences provided in this report.

Two observational studies, one with 56 Hispanic origin participants and the other comparison of two counties of rural African-American participants, implemented the DASH diet using common culturally known foods (unspecified in the study) (Corsino et al., 2012; Baker, Barnidge, Schootman, Sawicki, & Motton-Kershaw, 2016). The studies concluded that as long as the cultural food consumption maintained within the DASH diet daily serving target (mentioned above), and at a minimum incorporating vegetables, fruits, grains, meats, low dairy and fats, then patients can customize any food choices and still experience favorable blood pressure control

and achieve the adherence to the DASH diet (Corsino et al., 2012; Baker, Barnidge, Schootman, Sawicki, & Motton-Kershaw, 2016). The significance of these findings directs this project to will focus on creating the dietary interventional prescription using the 10 components of the DASH diet nutrients and their recommended daily servings target for the providers to use to patient educate their patients.

Also, motivational coaches, counselors, and or advisors also helped patients on weekly group sessions to stay adherent with the DASH diet during the given observation study period that resulted, in general, reduction of SBP (1.17mmHg SBP up to 14.3mmHg SBP) and lost an average weight of 3.6 pounds (Lima et al., 2013; Lin et al., 2013; Kucharska et al., 2018; Saneei et al., 2014; Epstein et al., 2012; Jarl, Tolentino, James, Clark, & Ryan, 2014; Watowicz et al., 2019). One study observed how counseling also reduced 1 BMI point, from 31.5-32 to 31 BMI (average weight loss of 3.6 pounds) in as short as two months (Jarl, Tolentino, James, Clark, & Ryan, 2014). Another study also supported that with the assistance of a healthcare professional, knowledge gain about the DASH diet will be achieved (Racine, Troyer, Warren-Findlow, & McAuley, 2011; Watowicz et al., 2019) in a form of patient education at every primary care appointment. The significance of this is that the providers will be the coach or advisors for the patients to encourage adherence to the DASH diet using the dietary interventional prescription. One study also gave participants manuals of the DASH diet as a take home reference to identify DASH diet foods (Lin et al., 2013). For this project, the interventional dietary prescription will serve as the take home reference for patients so they are able to select foods that contain the DASH diet-eating pattern, and the providers will use this as a teaching tool to show patients what DASH diet consist of during the patients' primary care appointments.

Local Problem

Locally, hypertension was just as problematic, as evidence by Arizona having over 30.7% of its population who are hypertensive (RWJF, 2018). Similar results were expected at ambulatory care clinics across Tucson, Arizona. In 2017, Arizona is ranked fourth in the US for hypertension death rate with 11.7 deaths for every 100,000 total population (CDC, 2019), and Arizona is predicted to have an 18.8% increase of projected hypertension cases by the year 2030 (RWJF, 2018b). In Pima County, where Tucson and metropolitan cities of it is located, the health behaviors of the population have significant figures that increase the risk of developing hypertension. Specifically, adult smoking (14% of the county's population), adult obesity (25%), inactive lifestyle (18%), and excessive alcohol intake (17%) are all risks factors on developing hypertension (UWPHI, 2018). These statistics are evidence that there is a high risk of developing hypertension, and an intervention is needed to improve the hypertension cases within the state of Arizona, in the county of Pima, and in the city of Tucson and within its surrounding areas.

The clinic that implemented this project was located in central Tucson, Arizona. This location was unique because it provided access to low to middle upper class income patients, those who were in Medicare/Medicaid and/or with private insurance or both, urban and rural population patient, and Native American population. The clinic was a multidisciplinary ambulatory clinic that consisted of eight medical doctors, five advanced nurse practitioner, two physician assistants, 10 medical assistants, and four medical service assistants/front desk staff, one group practice manager, providing primary care, pediatric care, endocrinology, urology, along with minor radiographic services, and outpatient phlebotomy. The entire clinic services over 20,000 patients on average throughout the year. The clinic also was networked to

cardiology, neurology, gynecology, vascular, general surgery, gastroenterology, acute care emergency services, two large inpatient hospitals and other specialty services (gastroenterology, physical and occupational therapy).

Stakeholders

The key stakeholders in this project included the primary care providers at the local clinic, the clinical office manager, the nursing staff, the author of this project, the project chair and committee members (consisted of three doctoral-prepared advance nurse practitioners) that overlooked this QI (quality improvement) project, and the pre- and hypertensive patients of the clinic. Also, the project required the buy-in from the participating providers, and from the healthcare staff working with the providers, such as, medical assistants, certified nursing assistants, and front-desk workers to help facilitated the continued use of the practices learned from this QI project. The clinic's clinical office manager was crucial in this QI since she organized the medical staff meetings, and the person who helped with internal QI process and approval. Furthermore, the project committee members were important since they provided support and guidance in developing the entire project, which included the intervention, means of data collection, and the methods. The support of these stakeholders was vital to reach the overarching purpose of this QI project, which was to improve the management of adult blood pressures and prevent the development of hypertension of patients receiving care at this local clinic in the southwest region of US.

Providers in this clinic voiced the concerns of hypertension and even pre-hypertensive blood pressures, because it was an asymptomatic manifestation. Adults in this clinic often times do not report that they were pre-hypertensive or hypertensive because they do not monitor their

blood pressure outside the clinic. Many of these adults were also not diagnosed with pre-hypertension or hypertension until they visited a provider and had their blood pressure taken. Often, adults contributed their increased blood pressure to their change of diet, by either eating out more, eating more during the holidays, stress eating, or unaware of the amount of certain foods they need to eat to better control their blood pressure. This QI project bridged those gaps, and introduced an effective and empowering knowledge to providers in order to counsel their patients to incorporate appropriate dietary changes to better control their blood pressures. Not having had addressed the increased blood pressures of patients, it would continue to silently damage many body organs, like, kidneys, eyes and visual acuity, and more (as mentioned at earlier sections), and lead to patients living a poor quality of life, and risk an early death.

Purpose

The main purpose of this project was to improve the patient education for dietary management of hypertension using the DASH (Dietary Approaches to Stop Hypertension) diet among patients of a local ambulatory healthcare center, in Tucson, Arizona. It used a brief educational intervention and patient educational tool. Educational information included appropriate diet recommendations to manage hypertension, leading to prevention of cardiovascular disease. The DASH diet (a diet that consists of low-fat dairy foods, and rich in fruits & vegetables) was an evidence-based recommendation that lowers sodium intake significantly, which in turn reduced blood pressure, and ultimately reduced the risk for developing cardiovascular diseases (Sacks et al., 2001). With this initiative, the broader goal was that the clinic patient population would increase their quality of life, while also having learned

the knowledge of which foods to choose in their daily lives that lowered their blood pressure, and avoid developing health consequences from cardiovascular diseases.

In order to move forward to meet this goal, it required that all stakeholders work together. Stakeholders were the people who were involved in activities that were significant during the process of producing results from this initiative (CDC, 2011; Leviton, & Melichar, 2016). The stakeholders involved were patients and their family, providers from all levels who oversee primary care patients (medical doctors, nurse practitioners, and physician assistants), medical assistants, and medical service assistants/front desk staff.

Aims

The first aim of this project was to create an evidence-based educational intervention prescription handout that the providers would use to customize heart healthy diet recommendations to their patient population. The intent was for the pre and hypertensive patients to change their typical or regular dietary eating pattern to the DASH diet, and the dietary prescription guided their change of behavior. The intent was for providers to use the dietary prescription to counsel their patients to select foods that were heart healthy diet all in a timely manner. All the diet recommendations were evidence-based, and it was advocated by the two national guidelines: American College of Cardiology/American Heart Association (ACC/AHA) Hypertension Guideline, and the Eighth Joint National Committee. The language of the handout was at a fourth to fifth-grade reading level that encouraged the understanding of the handout, and made providers' patient education effective.

The second aim of this project was having had presented the evidence-based educational intervention handout to all the providers in a local Tucson, AZ clinic. This presentation covered

the synopsis of the background information about hypertension, what the dietary prescription handout looked like, and how they would implement it to their patients. There were pre and post-test surveys that assessed how the providers viewed the handout, and how they thought was effective for their patients. Evaluating the effectiveness of the implemented evidence-based nutritional guide was important to determine if the patient education was effective enough to increase patients' understanding and learned what were the appropriate heart healthy choices to lower blood pressure through the counseling of the providers of this local clinic.

Study Question

In a local primary care clinic in Tucson, AZ, what was the effectiveness of an evidence-based educational intervention for providers to educate adult patients on nutritional recommendations for proper management of hypertension?

Theoretical Framework

The behavioral system model explained how individuals maintain and identified behaviors that are interconnected in order to adapt and combat against life stressors and diseases (Petiprin, 2016a; Johnson, 1990). The individual patient themselves is the system that maintains seven smaller systems that make up the behavioral system as a while. These subsystems are Achievement, Affiliative, Aggressive, Dependency, Sexual, Eliminative, and Ingestive (Petiprin, 2016b; Johnson, 1980).

Achievement is the mastery and control of a concept within the environment, which contains physical, intellectual, creative, social skills, and mechanical skills (Johnson, 1980; Butts, & Rich, 2018). This is presented when patients gain a certain level mastery to self-care, as evidence by taking over the counter medications they have access to, and when their conditions

are too overwhelming for them to handle, then they seek their providers. The target of this project is providing a tangible, patient education information handout in order to facilitate patients' gaining a new mastery of dietary concept that will manage blood pressure appropriately.

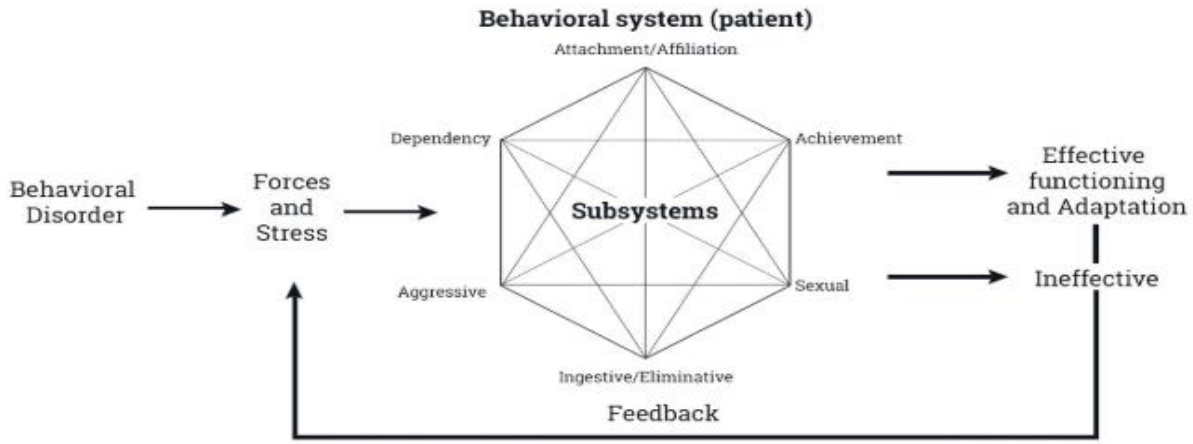


FIGURE 1. Behavioral system model. (This figure shows the subsystem within the entire system. Adapted from 'Dorothy Johnson: Behavioral System Model' by A. Gonzalo, 2014, *Nurseslabs.* Retrieved from https://nurseslabs.com/dorothy-e-johnsons-behavioral-system-model/)

Affiliative is the social inclusion, forming and maintaining social bonds, and intimacy (Johnson, 1980; Butts, & Rich, 2018). In patients, this is presented as the need to stay healthy physically (in order to engage in family and other social gatherings) and mentally (in order to engage in meaningful conversations) in order to be socially accepted by their family, friends and society in general.

The aggressive is to preserve and protect the entire system through survival behaviors (Johnson, 1980; Butts, & Rich, 2018). When patients seek medical care they are protecting themselves and their entire system in order to continue living a quality life. Another presentation of aggressive is their autonomy of choosing what medical treatment, plan, and behavior they choose to be engage with in order to preserve themselves and continue to live life. The project

will contribute to provide new knowledge to patients on consuming foods that will appropriately manage their blood pressure in order to help them maintain their aggressive nature of properly protecting themselves against cardiovascular diseases and hypertension.

Dependency is the acceptance of physical assistance (Johnson, 1980; Butts, & Rich, 2018). Patients depending on their providers for advance medical care is one of the ways patients exercise physical assistance. The sexual system is seeking gratification and procreation, which develops gender-role behaviors and identity (Johnson, 1980; Butts, & Rich, 2018). Providers assist patients achieving the task of the sexual system by assisting patients manage their blood pressure and prevent hypertension-induced impotence. Eliminative focuses on patients learning how, at what conditions, and time that are appropriate to eliminate bodily wastes (Johnson, 1980; Butts, & Rich, 2018), which is presented when patients relief their wastes in the restroom. Ingestive focuses on the management of nourishing the person that will best satisfy their entire system (Johnson, 1980; Butts, & Rich, 2018). The project will help patients with this aspect in terms of providing what foods to eat in order to properly manage their blood pressure.

There are three assumptions that the theory contains, and it is broken down to assumptions about the structure, about the functions, and about the system itself (Johnson, 1990; Butts, & Rich, 2018). The assumption about the system identifies that each subsystem works together and needs each other in order to properly behavior and maintain a healthy balance (Johnson, 1990; Petiprin, 2016a). The entire body itself adapts appropriately to it surroundings in order to maintain balance (Johnson, 1990; Petiprin, 2016a). The behavioral system creates consistencies and predictable actions that is significant to maintain the good health of the person

and to be accepted in the person's social life. The balancing act of the entire system requires the adaptation to be successful in order to find the balance that the person seeks to be healthy.

The assumption about the structure identifies the "set" is the preconditioned behaviors that will be acted on to meet the goal of each subsystems (Johnson, 1990; Petiprin, 2016a). Each of the subsystems are acted upon based on "scope of action," or their individual jobs that is needed for the entire system to be successful (Johnson, 1990; Petiprin, 2016a). Each choice of behaviors was aimed at accomplishing certain goal that will produce the best outcome for the entire system (Johnson, 1990; Petiprin, 2016a).

The assumptions about the functioning aspect identifies that actions will be done by the system in order to protect the entire system from toxic stressors that are difficult to recover from (Johnson, 1990; Petiprin, 2016a). The system within one's self also needs to grow and enhance by being stimulated using the environment (Johnson, 1990; Petiprin, 2016a). Equally important also is the necessity of being nurtured using the input from the supplies that the environment provides in order to achieve the right balance to be healthy (Johnson, 1990; Petiprin, 2016a). The major concepts of the theory are explained through Person, Environment, Health and Nursing.

The Behavioral System Theory (BST) guided this QI project. This theory was appropriate because it explained how the person and their behavioral system needed to achieve biological, mental, and physical balance to maintain a healthy life. BST has been used in several studies, such as a study that looked at nursing interventions having a positive health outcome to patients before discharge (Poster, Dee, & Randell, 1997); a study that observed specific interventions positively affecting patient behaviors, which lead to positive health outcomes (Poster & Beliz, 1992); and in a case study that depicted how nurse or clinician care intervention through

implementing care plans had a positive health outcome to children with leukemia (Ghanbari & Pouy, 2018). Looking around the healthcare system and the approach to treat patients today, BST is everywhere, as evidenced by how providers are the external stimuli that intervenes to promote positive health outcomes, and provide preventive medicine to fully balance patients' entire system.

Concepts

Person

The person makes up the behavioral system that manages the seven subsystems that are interconnected to achieve a life balance (Butts, & Rich, 2018). Clinicians are the entity that will focus on one's entire system because it is what drives the biological system (Butts, & Rich, 2018; Johnson, 1990). This project focused on the patient, and took advantage of the established, or new relationship, that they made with their providers to make patients feel that they were at the center of their medical care. By having had focused on the patient through the collection of history of their present illness and review of system questions, providers were able to pinpoint where the inappropriate amount of sodium intake comes from within patients' internal system, and determined the severity of the need to patient educate on proper food selections took better control of their blood pressures.

Environment

The environment was the external stimuli that influenced one's system, and any strong negative or positive forces tipped the person from being healthy or not (Loveland-Cherry & Wilkerson, 1989; Butts & Rich, 2018). This project incorporated what type of foods that patients had accessed to based on their surroundings, and accounted for age, culture, socioeconomic,

status, and health to select appropriate foods that patients were willing to consume that decreased their blood pressure.

Health

Physical and social health were determined by the interaction of biological, physiological, social and psychological elements, and how efficient and effective each of these elements were managed by the system (person) determined one's state of health (Johnson, 1980; Butts & Rich, 2018). Diseases or illnesses were factors that created imbalances within a person's system, and clinicians had the responsibility to help rebalance any imbalances (illness, etc.) that the patient experienced (Johnson, 1980; Butts & Rich, 2018). The project focused on how providers gave their patients education that encouraged them to picked heart health foods.

Caring

Care through clinicians was an external force that helped preserved the integrity of one's entire system through preventative medicine and or having had managed acute and chronic diseases (Johnson, 1980; Butts & Rich, 2018). Such force was provided to appropriately maintained, promoted restoration, and was necessary external influence that facilitated rebalancing one's imbalanced system owing to disease, etc. (Johnson, 1980; Butts & Rich, 2018). The intention of the project was for clinicians to work with their patients to modify and incorporate behaviors that rebalanced their patients' unbalanced system. It was important that clinicians' interventions used treatments that did not cause further harm and or worsen the imbalance that were brought on by disease processes. This was the overarching concept that explained all the other concepts. Clinicians have the medical professional background and

responsibility to help enhance patients' health by preventing or appropriately managing patients' blood pressures.

This project took the behavioral system aspects of changing patients' lifestyle behavior and the providers being the external stimuli that provided the patient counseling that used the dietary interventional prescription to rebalance the imbalance aspect (patients' inappropriate food selections that increased blood pressures) of patients' body system. The goal was for patients to adhere to the DASH Diet recommendations, with the intention of having them made it a part of their daily behavior, and move towards reducing hypertensive blood pressure readings. This was combing the person, environment, and health concepts, and identified patients who were at risk for developing or already have had hypertension, incorporate a patient education intervention on selecting heart healthy foods, and made this part of their behavioral system actions, and overall, improved their blood pressure readings, which was the factor the imbalances patients' system.

Johnson's Behavioral System Theory guided the project by having had focused on changing patient's behavior (their eating pattern), and guided by their provider as the health coach, in order to better control their pre or hypertensive blood pressures (Johnson, 1990; Johnson 1980; Butts & Rich, 2018). This relationship was the concept of the Johnson's Behavioral System Theory where the external entity, the provider, guided the change of their patient's behavior to maximize the opportunity of the patient to be as healthy as possible through the change behavior (Johnson, 1990; Johnson 1980; Butts & Rich, 2018).

Synthesis of Evidence

The synthesis of evidence to educate patients on lowering blood pressure with non-pharmacological means focused on searching for studies that had implemented a dietary pattern

that lowered blood pressure the most. The databases that were used to find these evidences were Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, Embase and Google Scholar. A literature review was conducted and used the terms hypertension, high blood pressure, randomized controlled trials, education, dash, diet, and dietary approach to stop hypertension. The strategies that were used were the Booleans AND, OR, and combing phrases or inputting single keywords into the search box, and restricted the dates between 2009 to 2019 with English published articles only. Initially, the search started with the use of Google Scholars, and the search resulted with over 615,300 articles. To further narrow the search, the strategy of using date restrictions reduced the results to over 120,000 articles. After reading through the titles, it gave ideas of what type of articles that were out there using the key terms listed above. Many of these articles also required fees to fully gain access to them, which prompted the search to switching databases from Google Scholar to CINAHL in order to avoid out of pocket costs to gain access for articles. In CINAHL, all of the strategies listed above were used, which initially yielded over 126 articles. After reading through the titles and abstracts, 58 articles qualified to be included in the search. In reading through 58 articles, ultimately, 10 articles were selected after performing an in-depth review of these articles: Ndanuko et al., 2016; Gay et al., 2016; Lima et al., 2013; Juraschek, Miller, Weaver, & Appel, 2017; Lin et al., 2013; Kucharska et al., 2018; Saneei et al., 2014; Epstein et al., 2012; O'Connor et al., 2018; Salehi-Abargouei et al., 2013. The in-depth review of articles involved reading the abstracts of the articles, identifying that the population samples had to be at least more than 20 with the study meeting 80% power of the study, and with statistical significance set at p value=<0.05 at a minimum to find studies with a strong quantitative data. From using these search strategies, the search narrowed from 58 to 20

qualifying articles, and after reading more through the 20 studies, 10 articles were selected as supporting evidences for this project. These 10 articles supported the DASH Diet as the evidence-based dietary eating pattern of choice as it was deemed overwhelmingly effective better managing hypertensive blood pressures in adults. To provide evidence for implementing the DASH Diet, the search turned to using PubMed database. The same exact strategies were used as mentioned above, and it ultimately yielded three articles: Baker, Barnidge, Schootman, Sawicki, & Motton-Kershaw, 2016; Jarl, Tolentino, James, Clark, & Ryan, 2014; Watowicz et al., 2019. The articles by Corsino et al., 2012 and Racine, Troyer, Warren-Findlow, & McAuley, 2011 were found using Embase, and performed the same exact strategies as mentioned above. Once research saturation was reached, a total of 15 articles were ultimately selected to support this project. Evidence Appraisal Table under Appendix D presents the in-depth appraisal review.

Dietary Pattern that Best Reduced Systolic Blood Pressure (SBP)

The Dietary Approach to Stop Hypertension (DASH) diet supported a significant amount of SBP reduction. The reduction ranged from 1.17mmHg SBP up to 14.3mmHg SBP (Ndanuko et al., 2016; Gay et al., 2016; Lima et al., 2013; Juraschek, Miller, Weaver, & Appel, 2017; Lin et al., 2013; Kucharska et al., 2018; Saneei et al., 2014; Epstein et al., 2012; O'Connor et al., 2018; Salehi-Abargouei et al., 2013). The DASH diet contained, in general, fruit and vegetables, nuts, legumes, whole grains, seeds, with low intakes of meat and saturated fat, low-fat dairy and reduced intake of other dairy products and vegetables and fruit juices (Ndanuko et al., 2016; Lima et al., 2013; Juraschek, Miller, Weaver, & Appel, 2017). Other diet patterns were compared that produced less amount of SBP reduction. Such diets were the typical American diet, no restrictions (Epstein et al., 2012; Juraschek, Miller, Weaver, & Appel, 2017),

Mediterranean diet (Ndanuko et al., 2016; Gay et al., 2016; O'Connor et al., 2018), and Nordic diet (Ndanuko et al., 2016). With the DASH diet yielding the largest reduction of SBP, this will be the dietary pattern that will be used to educate patients on in order to manage blood pressure effectively.

Strengths

One of the main strengths from all of these studies was the sample size and the study design to support the used of the DASH Diet. There were four systematic review studies that combined with over 290,615 participants, and six randomized controlled trails that observed over 1,472 participants (Ndanuko et al., 2016; Gay et al., 2016; Lima et al., 2013; Juraschek, Miller, Weaver, & Appel, 2017; Lin et al., 2013; Kucharska et al., 2018; Saneei et al., 2014; Epstein et al., 2012; O'Connor et al., 2018; Salehi-Abargouei et al., 2013). Having had this many participants created strong quantitative data, and supported the evidence that the DASH diet was the diet of choice to implement for this project. Another strength was how the DASH diet was clearly defined and universal throughout all the studies (Juraschek, Miller, Weaver, & Appel, 2017; Lin et al., 2013). This is significant because the dietary prescription that will be implemented for this project has a clear definition of what nutrients and serving size patients can consume to qualify as having a DASH diet. By knowing the nutrients and the serving size of what the DASH diet consist, it will enable providers to customize the dietary prescription for patients based on their individual preferences. The significant strength from all of these studies was the reduction of mean SBP when participants adhere to the DASH diet (Ndanuko et al., 2016; Gay et al., 2016; Lima et al., 2013; Juraschek, Miller, Weaver, & Appel, 2017; Lin et al., 2013; Kucharska et al., 2018; Saneei et al., 2014; Epstein et al., 2012; O'Connor et al., 2018;

Salehi-Abargouei et al., 2013). This finding heavily supported that the DASH diet will be the diet used as the dietary interventional prescription that will be presented to the providers and implement it to their patients to improve better control of their blood pressure.

Weaknesses

A gap in literature identified lack of evidence on how the DASH diet was implemented in primary care settings. This is one of the reasons why this project will be implemented in a local primary care setting. It will provide one of the methods on how to educate patients on eating a dietary pattern that supports lowering their blood pressure (SBP). This project will focus mainly on providing the nutrients and serving size the patients will need to consume to stay within the DASH diet, while the providers serve as the patients' counselors, advisors, and coaches to adhere to the DASH diet. Another gap in literature that was identified was the lack of studies that focused on decreasing diastolic blood pressure. There were only a few studies that suggested how there was a lack of evidence to suggest any benefits to controlling diastolic blood pressure over systolic blood pressure (Qaseem et al., 2017), and how diastolic blood pressure was difficult to isolate without effecting systolic blood pressure (James et al., 2014), which also showed insufficient evidence that managing a lower diastolic blood pressure were beneficial versus mainly observing systolic blood pressure (James et al., 2014; Qaseem et al., 2017).

The selected evidence for this project supported how DASH diet is the eating pattern that will lower SBP the most. Even though there is a gap in literature on how to implement a dietary eating pattern like the DASH diet in primary care setting, there are evidence that suggest several modalities, like, using a coach or advisor and providing patients a take home reference about the dietary eating pattern. The project used this concept to create a dietary prescription that consisted

of the DASH diet nutrients and its serving size recommendations, and have the providers as the main coach who would motivate the patients to adhere on this non-pharmacological treatment to better control blood pressures and prevent cardiovascular consequences.

METHODS

Design

This project assessed the effectiveness and satisfaction of a brief educational intervention and patient education tool on nutritional recommendations for management of hypertension. The study design used for this project was the quasi-experimental pre and post-test single group study that used convenience sampling. Quantitative pre and post-test surveys were used to assess improvements in providers' knowledge on the effects of the DASH Diet on blood pressure, increasing their prescribing practice of the DASH Diet, and empowering patients to change their dietary eating pattern by incorporating the DASH Diet through provider-driven patient education counseling. This sampling method and design was selected owing to having a small sample population, and collected data directly from the population of interest, whom were the clinic's healthcare providers. From pre- and post-test surveys, quantitative data collected data on the providers' intent, knowledge, and satisfaction characteristics. In addition, qualitative data was collected from the free-write section in the post-test survey that allowed the participants to give their input to improve the project for future use. The next sections discussed the setting, participants, intervention, data collection, and analysis methods.

Setting

The project was based at an urbanized central area of central Tucson, AZ, located at southwestern region of United States. This clinic is a multidisciplinary ambulatory care clinic

that provides primary care, pediatric care, endocrinology, urology, along with minor radiographic services, and outpatient phlebotomy. It provides healthcare access to low to middle upper class income patients, those who are in Medicare/Medicaid and/or with private insurance or both, urban and rural population patient, and Native American population. In this clinic, it consisted of eight physicians, five advanced practice nurses, two physician assistants, 10 medical assistants, and four medical service assistants/front desk staff, as well as the group practice manager of the clinic (GPM). The entire clinic serves approximately over 20,000 patients on average throughout the entire year. The majority of the adults seen in this clinic are pre-hypertensive or hypertensive at varying degrees (elevated, pre-hypertensive, stage 1 or stage 2). This local clinic gave interest on addressing blood pressure management amongst the patient population that used diet as a non-pharmacological means to prevent and/or delay the development of hypertension.

Participants

All clinic providers were invited to participate. The inclusion criteria were (1) ambulatory care providers seeing patients in this clinic, including physicians, nurse practitioners, and physician assistants, and (2) care for adult patients (age 18 or older) with hypertension. There were 14 providers at the clinic that met all of these criteria. The sample population, the providers, were recruited by sending an email invite with an overview of the project and a copy of the disclosure form (Appendix E) that was sent by the GPM to the medical providers prior to the date of the presentation. A target of 50% was planned, with a minimum of four participants.

Intervention

The project's intervention consisted of a brief educational presentation to primary care providers at a local clinic on how changing dietary eating patterns by incorporating the DASH Diet improved the management of pre and hypertensive blood pressures of adults, versus prescribing medications alone. The author conducted the presentation at a mutually agreed upon time at a designated conference room at this clinic. The presentation was presented in-person during a medical staff meeting, and it was presented using PowerPoint. It was 15 minutes long and covered the following: general effects of sodium with blood pressure; current blood pressure guidelines and recommendations; knowledge information on the DASH Diet; and what codes can the providers use for patient counseling on diet therapy to generate revenue for the organization. In addition, the presentation exposed the providers with the patient education prescription template (Appendix C) that can be used to facilitate patient counseling on how patients could incorporate the DASH Diet in their daily lives. The dietary prescription included what foods made up of the DASH Diet, the target nutritional serving goals to qualify as a the DASH Diet, and general example of foods that were in each food groups that patients can customize and choose foods that were appropriate to meet the DASH Diet recommendations. The patient education prescription was laid out in an organized manner for ease of use for patients, and that was navigated from left to right, top to bottom. The prescription intended to minimize "jumping around the page" to avoid confusion.

Tools

The tools that were involved in this project consisted of quantitative pre-test and post-test surveys located at Appendix A and Appendix B, and created using Microsoft Word. The

dissemination and use of the pre- and post-tests were provided in hard paper copy, which were inside a professional portfolio folder that all of the participants received. Each question was formatted in various of ways: multiple choice, True and False, and Likert-scale. In both surveys, no identifiable information was collected. The purpose of the pre- and post-test surveys assessed the participants' level of knowledge at pre- and post-intervention, level of satisfaction about the information presented and the dietary prescription, and the level of intent that the providers will use and give the dietary prescription to their patients. This assessment determined the effectiveness of the implementation of the project by the participants. In addition, to fully understand the needs of the providers on what additional information they would like to see on the dietary prescription and improve the presentation; free text box was included in the post-test in the form of free-write section labeled "Comments (Appendix B)." This step allowed the participating providers give input to improve the dietary prescription handout that will be given to their patients.

The data that pre-test (Appendix A) gathered consisted of type of providers, years of experience, approximate percentage of hypertensive patients he or she has managed, current nutrition prescribing practice habit, current perception of pharmacological and non-pharmacological management of hypertension, barriers to patient counseling on diet as an intervention, and questions that assessed the level of knowledge-base each providers had on the DASH Diet. Further, the post-test intended to collect quantitative data after the brief educational presentation intervention. The questions reassessed providers' knowledge on the DASH Diet and their post-test perception of prescribing the DASH Diet. These data was assessed to measure the changes that occurred at pre-intervention versus post-intervention. In the post-test survey,

qualitative data was collected that gained candid feedback from the participants about the project's intervention, and any other comments they wished to express about the project and its materials. The participants took 5 to 7 minutes to complete each of the pre-test and post-test (10-14 minutes total time), and no identifiable information was collected.

Process and Data Collection

The implementation of this project took place at a mutually agreed upon date and time between the GPM and the clinic's providers during their monthly medical staff meeting. One month prior to the implementation date, an invitation to participate was sent to the GPM, who then forwarded it to all primary care providers within the facility. This email contained the disclosure form that generalized the overview of project, risks, and benefits (Appendix E), and a hard paper copy was provided on the day of the presentation. Once the schedule was set with the designated location of the presentation, one week prior to the presentation, a second email was sent out as a reminder to the participants.

Upon arrival to the medical staff meeting, each participants who attended the meeting were given professional folders that included the following: disclosure form, pre-test, dietary prescription template, and the post-test survey. The disclosure form was reviewed and verbally read out to all the attending providers who wished to be a participant of this project. After the disclosure form was reviewed, the participants were given 5 to 7 minutes to complete the pre-test survey (Appendix A). Once all pre-tests were completed, the participants closed their portfolio to receive the educational intervention. Next, the educational intervention was presented using PowerPoint, along with the dietary prescription template that was located inside the participants' portfolios. Upon completion of the intervention, the participants were given 5 to 7 minutes to

complete the post-test survey (Appendix B). No identifying and personal data were collected or requested as a requirement of the study. Concluding the educational intervention, all portfolios were collected by the author to be place in a box that was locked and secured. An email of the dietary prescription template was emailed to the providers by the GPM for the providers to use as a patient education tool. Data from these surveys were analyzed, and they were also entered into Excel to create graphs for present them at the Results section of this report. All hard copies of the surveys with participants' responses were shredded and destroyed.

Data Analysis

Excel was used for data analysis. Data that was collected from any paper pre- and post-test surveys was entered as above, and the original documents were destroyed. Survey responses were used to create the descriptive statistics of mean, median, and mode. Mean was used to find the central tendency of all the responses given; the median negates the outlier data from all the responses; and mode provided the most common responses (Motulsky, 2014). The descriptive quantitative data collected at baseline and post intervention data were used to conduct a comparison study between the two sets of data for analysis. Also, descriptive statistics was used to summarize sociodemographic data of the participants, the percentage of hypertensive patients the providers were managing, nutrition prescribing habits and practice, perception of pharmacological and non-pharmacological management of hypertension, barriers to counseling patients on diet as an intervention in this clinic, assessed the knowledge-base of each participating providers on the DASH Diet, and satisfaction of the QI project. The proportion of the responses regarding the knowledge questions and the values of the Likert-scale responses was compared between pre-test to post-test surveys. The free-write responses were summarized.

Dissemination

In the form of an executive summary, the background information, purpose, intent, and evidence-based recommendations was shared with the clinical GPM and all the medicine clinic staff for dissemination. The collected descriptive and aggregate data were the only information shared to protect the identities of the participants.

Ethical Considerations

The Belmont Report's basic ethical principles *Respect for Persons*, *Beneficence*, and *Justice*, were used to ensure protection the human subjects in this project (HHS, 2018). The Belmont Report outlined the conduct of behavioral and biomedical research, and defined them as the basic ethical principles (HHS, 2018). This project upheld these principles to appropriately conduct this study.

Respect for Persons

Respect for persons allowed expression of autonomy to make participants' own choices, and protected the participants (HHS, 2018) (security, privacy, data management). Respect for persons was fully upheld by disclosing all the aspects, ideas, concepts, data, and intentions of this project, and all potential participants were offered to be part of the project or not without coercion (HHS, 2018). Participation was voluntary, and the participants were able to withdraw at any period of the study without consequences. Also, respect for the participants was upheld by not disclosing any identifying personal information, and the demographic information collected were only used for characterizing the participants (HHS, 2018). Data that will be collected will not have any identifiable information, and all data that were used was password protected, locked, and encrypted.

Beneficence

Beneficence is not to cause any harm and maximize benefits to participants and anyone involved (HHS, 2018). Beneficence was considered in this project when it was implemented by not hurting anyone physically, mentally, and emotionally, and it provided beneficial recommendations to improve patient care (HHS, 2018). The interventional presentation provided evidenced-based recommendations from the most effective dietary eating pattern that was cited to improve the management of pre and hypertensive patients' blood pressure, which benefits patients the most.

Justice

Justice is sharing all benefits to all the participants and not excluding anyone from benefiting from the study (HHS, 2018), while also sharing all the information and data to all the participants. Justice was upheld by having an inclusion and exclusion criteria that were not biased to wealth, socioeconomic status, race, sexual orientation, profession or gender (HHS, 2018). All of the healthcare professionals who were considered were all invited to be participants voluntarily. They had the option to refuse being part of the project, or consent to being one of the participants without any coercion or influence from anyone. It was addressed that the only purpose for this project was to increase knowledge base and improve patient care. The final approval to implement this project was granted from the Carondelet Medical Group-Central clinic, and reviewed by the University of Arizona Institutional Review Board (IRB), which found this project exempt from IRB.

RESULTS

Participants

Twelve healthcare providers attended the educational intervention presentation, and 11 out of the 12 attendees completed both the pre-test and post-test. The participants consisted of six medical doctors, four advanced practice nurses, and two physician assistants. The years of experiences amongst the participants were: n= 2 reported < 1 year of experience; n=1 reported 1 to 3 years; and n=9 reported >= 8 years of experience. Figures 2 and 3 depicted these results.

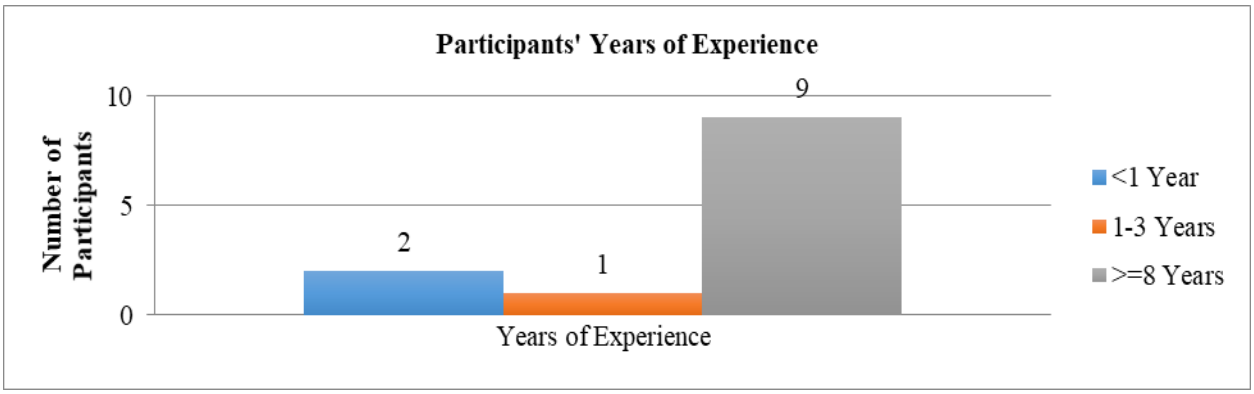


FIGURE 2. Years of experience practicing as a healthcare provider.

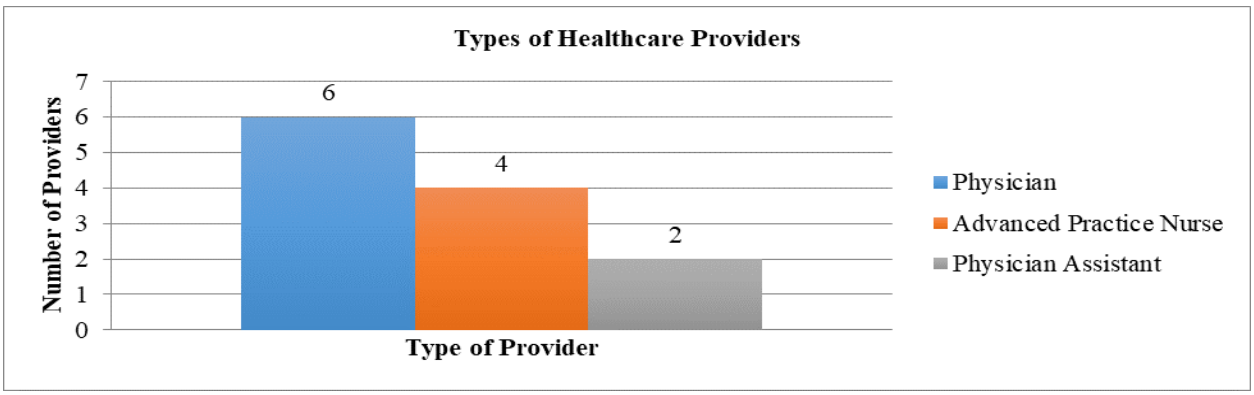


FIGURE 3. Participants' profession.

Amount of Pre- and/or Hypertensive Patients

Each participant rated, in percentage, the amount of patients they managed who were pre- and/or hypertensive within their patient panel. The results showed that three providers managed 10%-15% of their patient panel who were pre- and/or hypertensive patients, three others managed 20-25% of their panel, two participants managed 30%-35%, one managed 40-45%, and three others managed >= 50% of their panel. These results indicated that each provider approximately managed between 140 patients to as much as 710 patients pre- and/or hypertensive patients per 1400-1500 patient panels. Figure 4 depicted this result.

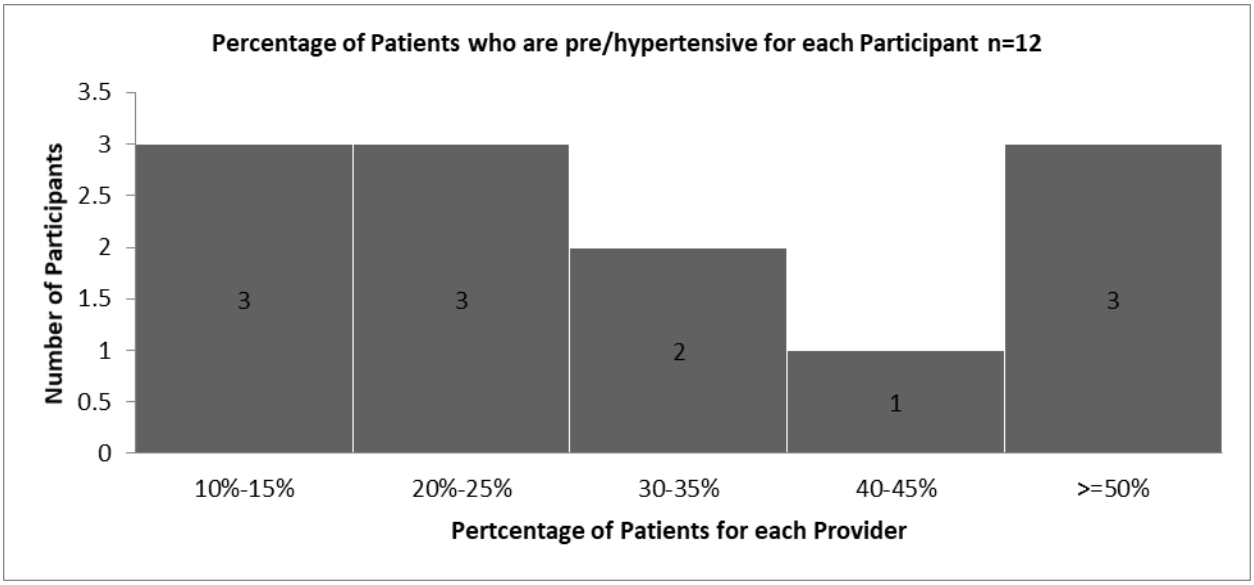


FIGURE 4. Percentage of pre- and/or hypertensive patients in a participant's patient panel.

Dietary intervention prescribing habits of each participant. The participants were asked to describe their frequency of prescribing dietary intervention to manage patients' blood pressure. The result of the report indicated that seven providers indicated that they 'Sometimes' prescribe a dietary intervention, none indicated that they 'More often than sometimes' prescribe a dietary intervention, two providers indicated that they 'Often, more than sometimes' prescribe

a dietary intervention, three indicated that they prescribe a dietary intervention ‘Every time or more than often,’ and none indicated that it ‘Did not even cross my mind to prescribe’ a dietary intervention. Figure 5 below illustrated these results.

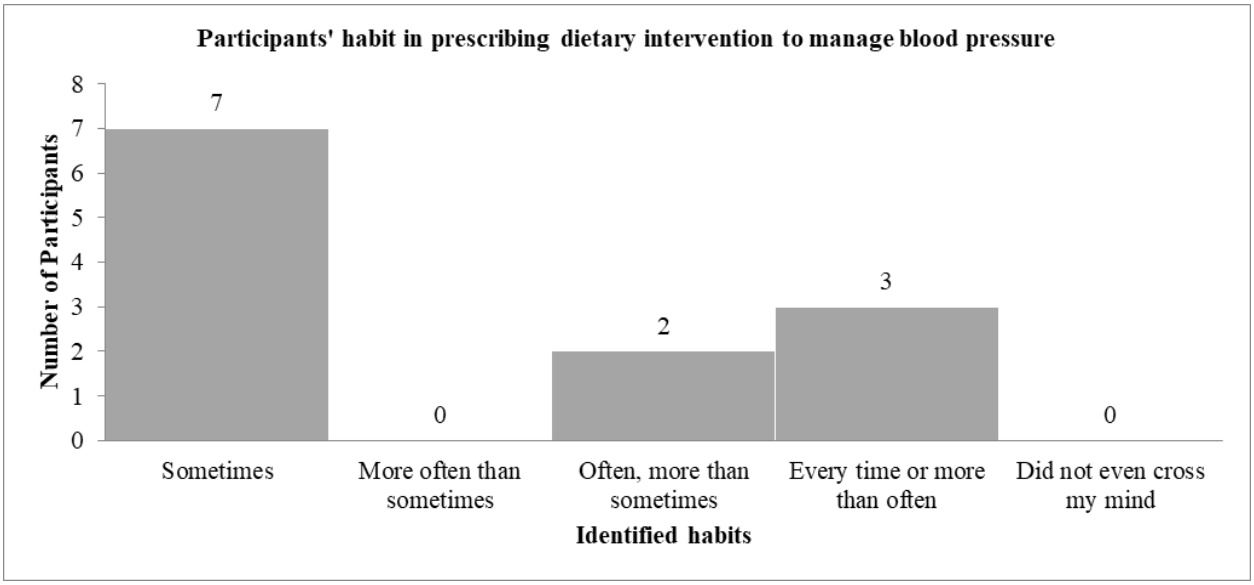


FIGURE 5. Participants’ prescribing habits of dietary intervention.

Participant’s perception of barriers that exist. The participants were asked to identify the barriers that hindered prescribing dietary intervention to patients. The result of the participants’ responses were: eight responses that selected ‘Limited amount of time with patient,’ two responses that selected ‘Lack of organizational patient education resource and handouts,’ and one response that selected ‘Too complex for patients to understand dietary prescriptions.’ There were three responses that selected ‘Other barriers,’ which identified two responses that indicated ‘insurance’ as a barrier, and one response that indicated ‘patient compliance’ issue as another barrier. Figure 6 depicted these results.

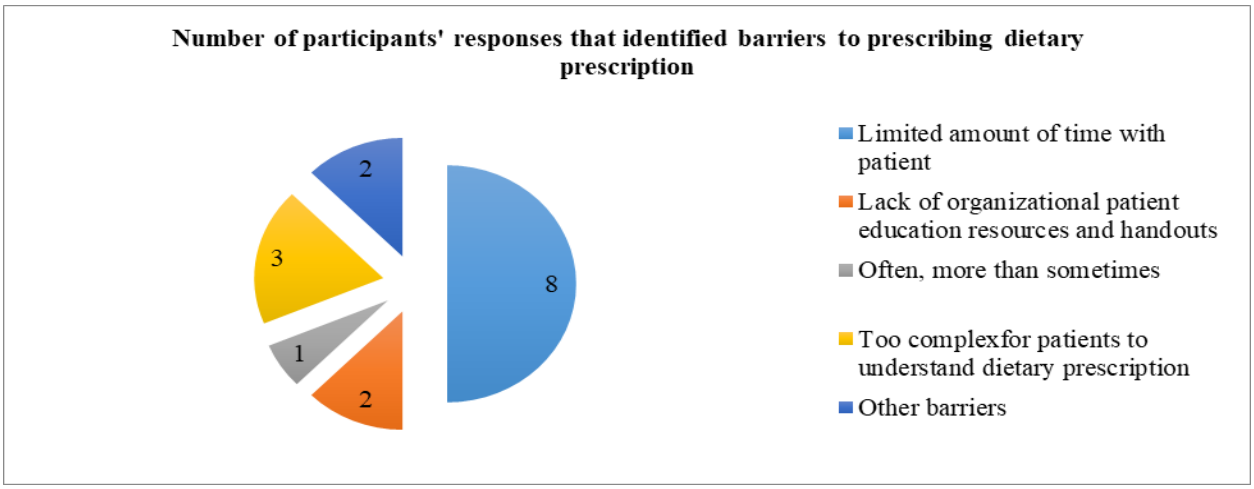


FIGURE 6. Barriers to prescribing dietary intervention identified by participants.

Pre-Test

The pre-test survey assessed for the central tendency of all the participants in four main characteristics, and mean, median and mode were used to depict this information. First, knowledge about the DASH Diet was assessed out of seven questions, and the total numbers of correct answers were tallied. The mean knowledge of all participants were 41% correct answers, with a median score of 43%, and 43% were the most common score (mode) from all the participants. Second, DASH Diet guideline knowledge was assessed out of three questions that resulted with a mean score of 70%, median score of 67%, and most common score of 67%. Third, the frequency of prescribing dietary intervention of all the participants was assessed out of three questions, which resulted in mean scores of 42%, median score of 33%, and most common score of 33%. Fourth, the participants scored their perception that the DASH Diet improves blood pressure control as much as medications, and they scored them between 10% to 100%. The mean score was 64%, with the median score of 65%, and most common scores were 50%

(n=3) and 100% (n=3). Table 1 below depicts these results. There were a total of 12 participants that completed the survey.

TABLE 1. *Pre-test results (n=12).*

Categories of Questions	Mean	Median	Mode
Knowledge questions (out of 7 questions)	41%	43%	43%
DASH Diet Guidelines knowledge questions (out of 3 questions)	70%	67%	67%
Prescribing dietary intervention habits (out of 3 questions)	42%	33%	33%
Perception of dietary intervention (rated scores in 2 questions)	64%	65%	50% + 100%

Post-Test

Unlike the pre-test, there were 11 out of 12 participants that completed the survey. Similar questions were asked to reassess the participants' responses after the intervention was conducted. The reassessment of knowledge resulted in mean score of 84%, median score of 86%, and mode score of 100%. The knowledge of the DASH Diet guideline was also reassessed, and it resulted in mean score of 89%, median score of 100%, and mode score of 100%. The perception of prescribing the DASH Diet was also reassessed, and it yielded mean score of 86%, median score of 100%, and mode score of 100%. The participants' perception of the dietary intervention was also reassessed, and it resulted with a mean score of 80%, median score of 90%, and mode score of 100%. Table 2 below depicts the post intervention data.

TABLE 2. *Post-test results (n=11).*

Categories of Questions	Mean	Median	Mode
Knowledge questions (out of 7 questions)	84%	86%	100%
DASH Diet Guidelines knowledge questions (out of 3 questions)	89%	100%	100%
Prescribing dietary intervention habits (out of 3 questions)	86%	100%	100%
Perception of dietary intervention (rated scores in 2 questions)	80%	90%	100%

The post-test also assessed three additional outcomes that assessed the effectiveness of the intervention. It assessed (1) the new intension of increasing the prescribing of the DASH Diet, (2) the appropriateness of the time, the material presented, and the effectiveness of the educational brief, and (3) the effectiveness of the dietary prescription based on ease of use, and perception of usefulness for patients. All 11 surveys resulted in responses that the participants would now generally increase their prescribing practice of the DASH Diet (100% response rate from all participants), the dietary prescription presented to them was effective (100%), and the dietary prescription would be effective if patients were to use it (100%). Below depicts this data (Table 3).

TABLE 3. *Post-intervention effectiveness (n=11).*

Categories of Questions	Mean	Median	Mode
Intention of prescribing the DASH Diet (1 question)	100%	100%	100%
Effectiveness of presentation (2 questions)	100%	100%	100%
Usefulness of the dietary prescription for patients (3 questions)	100%	100%	100%

Free Text Responses

The post-test also asked participants to comment on any recommendations to improve the presentation and/or the dietary prescription, or if there were missing information that they would like to see in the future. There were three free text comments out of 11 surveys. The summaries of these responses were: (1) two types of diet was locally studied, and it showed favorable results for patients; two responses

Comparison

The data analysis that was conducted for this QI project compared pre and post intervention mean, median, and mode scores of all the outcome measures. Figure 7 compared the

mean scores of the pre-test and post-test results, Figure 8 compared the median scores, and Figure 9 compared the mode scores, respectively. The percentage changes between pre-test and post-test outcome measures are all positive trends, and are as follows: knowledge (mean 43%+; median 43%+; 57%+); DASH Diet guidelines knowledge (mean 19%+; median 33%+; mode 33%+); dietary prescribing habits (mean 44%+; median 67%+; mode 67%+); and perception of dietary intervention (mean 16%+; median 25%+; mode 50%+). Table 4 depicts these results.

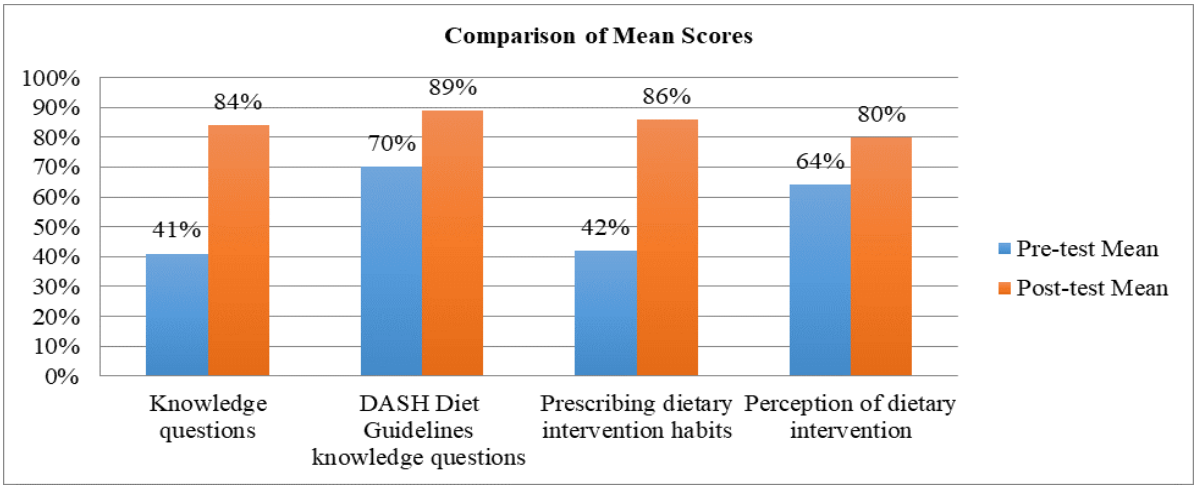


FIGURE 7. Comparison data of pre-test and post-test mean scores.

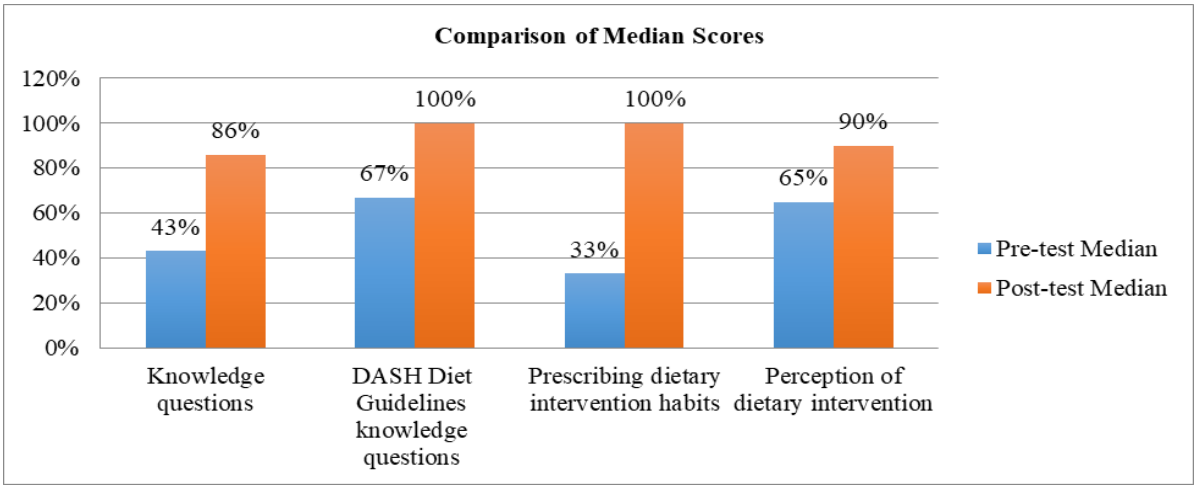


FIGURE 8. Comparison data of pre-test and post-test median scores.

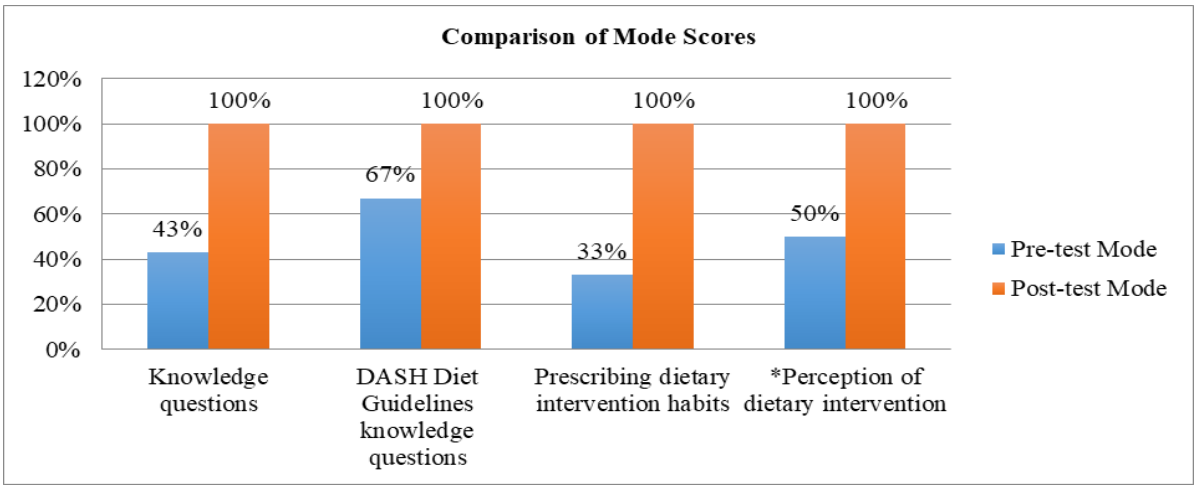


FIGURE 9. Comparison data of pre-test and post-test mode scores. (*Perception of dietary intervention had two modes for pre-test results, 50% (n=3) and 100% (n=3), that was expressed as 50%, because the post-test response were all 100%.)

TABLE 4. *Comparison of pre-test vs. post-test results in percent change.*

Categories of Questions	Mean	Median	Mode
Knowledge questions (out of 7 questions)	43%+	43%+	57%+
DASH Diet Guidelines knowledge questions (out of 3 questions)	19%+	33%+	57%+
Prescribing dietary intervention habits (out of 3 questions)	44%+	67%+	67%+
Perception of dietary intervention (rated scores in 2 questions)	16%+	25%+	50%+

DISCUSSION

The intention of this QI project was to (1) improve provider knowledge on the effects of diet on patients' blood pressures, and to use the DASH Diet prescription for patient counseling, (2) increase providers' intent to prescribe the dietary prescription, and (3) evaluate satisfaction with the content and delivery of this educational intervention. To accomplish this intent, a brief educational presentation on the DASH Diet and on a dietary prescription template was conducted for 12 providers at a local primary care clinic in Tucson, AZ. The participants completed a pre-test survey prior to the brief educational intervention, and a post-test survey at the conclusion of

the brief. All of the responses were used for data analysis. The results of the analysis and the QI project were discussed further below. This project demonstrated the effectiveness of the brief educational intervention, increased provider's knowledge about the DASH Diet and how to use the dietary prescription and found the information satisfactory by the participants.

Participants and Variables

Participants

The participants in this project consisted of 12 primary care providers that consisted of six medical doctors, four advanced practice nurses, and two physician assistants. All 12 participants received the presentation and completed the pre-test, but 11 out of 12 participants completed the post-test survey. Despite the post-test having 11 completed surveys out of the total participant of 12, having had one less post-test survey did not skew the results and the general central tendency of the participant's responses. Also, this was an experienced group of participants as evidenced by 75% (n=9) of them reported having more than or equal to 8 years of experience. The other three participants reported having 1 to 3 years of experience, which gave the project a wide range of years of experience.

Each provider also reported having approximately between 140 to as much as 710 patients in their patient panel of about 1,420 who were pre-hypertensive and/or hypertensive, which made this project very relevant for this local site. The general census of the sample population's prescribing habits of a dietary intervention was that they infrequently (n=9) prescribed them compared to frequently prescribed them (n=3). The identified barriers to prescribing a dietary intervention amongst the participants were 'limited amount of time with patients (8 responses from participants),' 'too complex for patients to understand a dietary

prescription (3 responses),' 'lack of organizational patient education resources and handouts (2 responses),' and 'other barriers, insurance (2 responses).'

Knowledge

Basic knowledge on the DASH Diet was assessed on pre- and post-test surveys, which then, all the responses were collected and calculated in the results section above. Knowledge was assessed to gauge the effectiveness of the brief educational intervention presentation to the participants. Descriptive statistics of mean, median, and mode were the main analysis in this project that depicted central tendency of the participants. The outcome measures of the knowledge resulted in all positive changes that suggested knowledge base of all the participants were effective, and all the participants increased their knowledge of the DASH Diet. The final results of the pre and post-test comparison were mean percentage change of 43%+, median change of 43%+, and mode change was 57%. The major outcome suggested that knowledge was gained from pre-test to post-test, deeming the educational brief effective.

DASH Diet Guidelines

Knowledge base on the DASH Diet guidelines were assessed similar to the analysis of the basic knowledge on the DASH Diet. As mentioned above, the two main guidelines that were used in support of the DASH Diet were the JNC 8 and the AHA/ACC Hypertension Guideline. This knowledge base was assessed in order to influence the increase of the prescribing habits of the DASH Diet. The intention was presenting the DASH Diet is not just a 'fad' diet, and it was in fact a heavily studied dietary eating pattern that consisted of statistically and clinically significant systematic reviews, meta-analyses, randomize controlled trials, and other Level 1/Grade A studies. The results suggested that the gap of knowledge on the guidelines were

closed amongst the participants, as evidenced by the mean, median, and mode having had all positive percentage gains of 19%+, 33%+, and 57%+, respectively. This suggested that the providers were effectively educated on the DASH Diet being heavily supported by two major cardiovascular organizational guidelines that showed favorable results.

Prescribing dietary intervention habits. The project also assessed the participants on their prescribing dietary intervention habits before the project's intervention, and their future intention to prescribe the DASH Diet after the intervention. The results suggested that the participants were infrequently prescribing a dietary intervention, but after the presentation, their future intentions to prescribe the DASH Diet increased, as evidenced by the mean percentage increase of 44%+, the median increase of 67%+, and the mode increase of 67%+. This suggested that the presentation was effective in bringing awareness about the DASH Diet, and after the participants learned about it, their intentions to prescribed increased.

Perception of dietary intervention. The participant's perception of dietary intervention was also assessed in order to gain information about their outlook on diet as an effective intervention for blood pressure control with their patients. The results suggested that there was a change with the participants' outlook on diet being effective in blood pressure control, as evidenced by mean positive percentage change of 16%+, median change of 25%+, and mode change of 50%+. This change of perception suggested that the educational intervention was effective because there was a positive change after the participants received the intervention. Having a positive perception on dietary intervention will help motivate the participants increase their prescribing habits.

Satisfaction

The post-test assessed the participants' satisfaction with the brief educational intervention, and the results were 100% positive. The post-test asked a 'yes' or 'no' response that asked the appropriateness of the time length of the presentation, the usefulness of the prescription and if it was user friendly. All 11 post-test surveys that were completed all said yes to all the questions. The project assessed the consistency of these responses by also asking the participants if they will increase their prescribing habits of the DASH Diet and if the project's intervention was useful in their future practice, and 100% of the post-test response were 'Yes.' Overall, the participants were satisfied with the project's intervention and the dietary prescription, because of how they learned about the DASH Diet, it presented a patient education prescription template that was effective, and it changed their future DASH Diet prescribing intention more frequently.

It was important that the participants were satisfied with the information presented to them and with the dietary intervention because it will influence their future practice to increase the prescribing of the DASH Diet. The participants would be the health coach to change their patient's eating behavior in order to control their blood pressure, and preventing or delaying the development of hypertension. This patient-provider interaction satisfies Johnson's Behavioral System Theory by the external entity, the providers, guiding the change of patients' eating behavior in order to maximize the opportunity of the patient to be as healthy as possible (Johnson, 1990; Johnson 1980; Butts, & Rich, 2018).

Free-Write Responses

The post-test asked the participants to free-write any comments about the presentation and the dietary prescription. There were three comments that were written. One survey commented that this participant liked the diet of hope and the wheat belly diet, and wrote the local medical doctors that also liked these diet options. This indicated that other local providers in the community favored dietary interventions. The two other comments wrote, 'Great job!' which suggested that they were satisfied with the information they received from the brief educational intervention.

Strengths and Weaknesses

There were several strengths in the QI project. First, the intervention closed the gap on knowledge deficit about the DASH Diet. The majority of the participants knew limited information about the DASH Diet, but after the intervention, they learned specific information about the DASH Diet, and how it was an effective eating pattern against controlling blood pressures that was backed by two major cardiovascular organizations. Second, 12 out of 15 primary care providers in this local clinic participated in this QI project. This suggested that the targeted population in this clinic received the same intervention's information, and the patient population would now receive consistent information from each of the providers about the DASH Diet. Second, 12 participants completed the pre-test, which provided comparative information for the project's comparison study. Despite the post-test having had an 11 out of 12 return rate, it still did not skew the central tendency of the participants' responses. The comparison study was assessed that indeed there was knowledge learned, future intention to prescribe the DASH Diet increased, and there was a clear consensus that the participants were

satisfied with the information and the delivery of them, which were all the purpose of this QI project. Third, this local clinic was approved to be able to use the dietary prescription and the information presented in the brief educational intervention, which further confirmed the satisfaction of the information presented to the participants.

One weakness of the study was the limited amount of participants in the project. In order to have had a more robust statistical significance between the pre- and post intervention, it would had required a much larger sample size to be able to conduct a more precise correlation data analyses, such as t-test, ANOVA, or p-value, hence, the most appropriate descriptive statistics that depicted the results were mean, median, and mode. Second, the project did not conduct a pre and post interventional comparison study of the patient population in this local primary care clinic. This study was limited in resources and time to have had conducted an extensive study. The study also did not examine patient outcomes, such as impact on patient understand or knowledge on blood pressure control.

Conclusion

The QI project that was conducted in this local primary care clinic was overall effective and appropriate for its participants. It revealed that there was a knowledge gap about the efficacy of the dietary intervention, the DASH Diet, and the guidelines that heavily supported it. This QI project bridged that gap, and now the providers in this clinic had gained knowledge and evidence to help change the eating behaviors of their patient population by increasing the rate of the DASH Diet being prescribed by the providers. The analysis of this comparison study reported that the purpose of the QI project was achieved as discussed in the results and discussion section.

Recommendations

To further facilitate the distribution of the dietary prescription presented in this project, this local clinic could send information through their patients' secure messaging portal and provide a hard copy during their visit. Increasing the access to this dietary prescription will ensure that patients will have all the resources they need to implement the DASH Diet. Further, sending the dietary prescription via patients' secure messaging would encourage patients to send questions to their providers about the diet to help patients adhere to the dietary prescription outside the clinic. It is also recommended to commercialize the DASH Diet more by posting posters throughout the clinic and making the DASH Diet part of all the providers' conversation with their patients at every appointment. The more the patients hear and see about the DASH Diet, the more they will be motivated to adhere with their dietary prescription given by their providers.

This QI project could be repeated at other primary care clinics to confirm the findings of this project. Also, future studies will need to assess both the providers giving the patient education prescription and the patients receiving it in order to fully understand the effectiveness of the DASH Diet. The intervention could be tailored to assess how different methods of implementation could be used based on resources of the study site. Future studies can be conducted in a big hospital network that consists of multiple outpatient services that manage patients' blood pressures. Conducting a large study will enable the use of more robust statistical analyses that will have a more precise statistical correlation between the pre- and post intervention.

Hypertension continues to be a heavy burden amongst adults in the US. It leads to high mortality rate by contributing to cardiovascular events, such as myocardial infarction and stroke (Murphy, Kochanek, Xu, & Arias, 2015; Chobanian et al., 2003; Yoon et al., 2014). Fortunately, hypertension is a preventable risk factor by means of appropriately managing patient's blood pressure through pharmacological and non-pharmacological methods (Whelton et al., 2018; James et al., 2014). This project focused on the non-pharmacological method by specifically influencing patients to change their eating habits using the DASH Diet. The DASH Diet was the recommended dietary prescription for adults, because it was backed by an overwhelming evidence that significantly reduced SBP by as much as 14.3 mmHg (Lima et al., 2013; Lin et al., 2013; Kucharska et al., 2018; Saneei et al., 2014; Epstein et al., 2012; Jarl, Tolentino, James, Clark, & Ryan, 2014).

With the providers being the main coaches of patients to guide their eating habits using the DASH Diet, patients can reduce their blood pressure, and prevent the complications of hypertension. It was imperative that providers were reminded to focus how diet impacted blood pressure control in order to influence them to increase the prescribing habits of the DASH Diet to their patients. This project primarily assessed the providers' knowledge on the relationship between the impact of the DASH Diet and patients' blood pressures, increased their awareness on the current evidence of the DASH Diet, and influenced them to increase their prescribing habits of the DASH Diet. This showed that a local primary care clinic was willing to take the step forward to address hypertension, which is a national concern that continues to plague many Americans.

APPENDIX A:

PRE-TEST

Pre-Test

Describe your health profession

a. Physician

b. Nurse Practitioner

c. Physician Assistant

Describe the most accurate years of experience you have as a provider

a. <1 year

b. 1-3 years

c. 4-7 years

d. >= 8 years

Estimate the number of patients you care for those are pre-hypertensive and hypertensive:

a. 10%-15%

b. 20%-25%

c. 30%-35%

d. 40%-45%

e. >= 50%

Frequency of prescribing dietary prescription to manage blood pressure (writing a prescription to change dietary eating patterns for pre/hypertensive patients).

a. Sometimes

b. More often than sometimes

c. Often, more than sometimes

d. Every time or more than often

e. Did not even cross my mind to prescribe

What barriers currently present that does not allow you to prescribe dietary prescription? Select all that apply:

a. Limited amount of time with patient

b. Lack of organizational patient education resource and handouts

c. Too complex for patients to understand dietary prescriptions

d. Other barriers (please write in your response): _____

I am familiar with the DASH diet

1 2 3 4 5 6 7 8 9 10
Unfamiliar Some what familiar Subject matter expert

I would prescribe the DASH diet to my pre/hypertensive patient population

1 2 3 4 5 6 7 8 9 10
Never More often than not Always

I believe that the changing to the dietary eating pattern of the DASH diet improves blood pressure control as much medications

1 2 3 4 5 6 7 8 9 10
Does not help Some what helps It definitely helps

I believe in only prescribing medications to manage blood pressure

1 2 3 4 5 6 7 8 9 10
Medications alone are not effective Medications are somewhat effective Medications are the only effective means

Define the acronym DASH

a. Dietary Acknowledgement to Stop Hypertension

b. Dietary Awareness to Stop Hypertension

c. Dietary Accuracy to Stop Hypertension

d. Dietary Approach to Stop Hypertension

I generally prescribe the DASH diet to my patients
a. Yes
b. No

T/F: The DASH diet reduces systolic blood pressure between 5-8 mmHg or less
a. T
b. F

T/F: The DASH diet is labeled as only eating less sodium
a. T
b. F

T/F: The 8th Joint National Committee cites DASH diet to be the preferred diet to manage blood pressure
a. T
b. F

T/F: The DASH diet does not restrict calories, only sodium intake
a. T
b. F

The DASH diet restricts sodium between

a. 1000mg to 1200mg

b. 1500mg to 2400mg

c. 1200mg to 2100mg

d. 1800mg to 2200mg

The DASH diet reduces systolic blood pressure by

a. 1-3 mmHg

b. 2-5 mmHg

c. 5-8 mmHg

d. 1-11 mmHg

How many dietary nutrients (fat, sodium, carbs, etc.) does the DASH diet contain?

a. None; only restrict sodium intake

b. 2

c. 6

d. 10

What two organizations cite the DASH diet in their clinical practice guideline?

a. None; the DASH diet is not cited in any guidelines

b. American Red Cross and American Medical Association

c. American Physician Scientist Association and Association of American Physicians

d. American College of Cardiology and American Heart Association

The level of evidence to use DASH diet as a non-pharmacological means to control blood pressure is:

a. A

b. B

c. It is not researched, only briefly mentioned in studies

d. C

APPENDIX B:

POST-TEST

Post-Test

I am familiar with the DASH diet

1 2 3 4 5 6 7 8 9 10
Unfamiliar Somewhat familiar Subject matter expert

I would prescribe the DASH diet to my pre/hypertensive patient population

1 2 3 4 5 6 7 8 9 10
Never More often than not Always

I believe that the changing to the dietary eating pattern of the DASH diet improves blood pressure control as much medications

1 2 3 4 5 6 7 8 9 10
Does not help Some what helps It definitely helps

I believe in only prescribing medications to manage blood pressure

1 2 3 4 5 6 7 8 9 10
Medications alone are not effective Medications are somewhat effective Medications are the only effective means

Define the acronym DASH
a. Dietary Acknowledgement to Stop Hypertension
b. Dietary Awareness to Stop Hypertension
c. Dietary Accuracy to Stop Hypertension
d. Dietary Approach to Stop Hypertension

T/F: The DASH diet reduces systolic blood pressure between 5-8 mmHg
a. T
b. F

T/F: The DASH diet is labeled as only eating less sodium
a. T
b. F

T/F: The 8th Joint National Committee cites DASH diet to be the preferred diet to manage blood pressure
a. T
b. F

T/F: The DASH diet does not restrict calories, only sodium intake
a. T
b. F

The DASH diet restricts sodium between
a. 1000mg to 1200mg
b. 1500mg to 2400mg
c. 1200mg to 2100mg
d. 1800mg to 2200mg

The DASH diet reduces systolic blood pressure by
a. 1-3 mmHg
b. 2-5 mmHg
c. 5-8 mmHg
d. 1-11 mmHg

How many dietary nutrients (fat, sodium, carbs, etc.) does the DASH diet contain?
a. None; only restrict sodium intake
b. 2
c. 6
d. 10

What two organizations cite the DASH diet in their clinical practice guideline?
a. None; the DASH diet is not cited in any guidelines
b. American Red Cross and American Medical Association
c. American Physician Scientist Association and Association of American Physicians
d. American College of Cardiology and American Heart Association

The level of evidence to use DASH diet as a non-pharmacological means to control blood pressure is
a. A
b. B
c. It is not researched, only briefly mentioned in studies
d. C

I will generally increase my prescribing practice of the DASH diet to my patients after this presentation
a. Yes
b. No

The presentation will be useful for my future practice:
a. Yes
b. No

The length of time of the presentation was:
a. Appropriate
b. Inappropriate

The patient education dietary prescription will be:
a. useful in my practice
b. not useful in my practice

The patient education dietary prescription format is user friendly:
a. Yes
b. No

The dietary prescription handout will be useful for my patients to have at home:
a. Yes
b. No

Comments (Please write any recommended changes or any missing information to be added to the (1) presentation and/or (2) patient education dietary prescription):

_____

_____

_____

_____

APPENDIX C:

DIETARY PRESCRIPTION

Using Diet to have a better Blood Pressure

Step 1: Get measuring cups and spoons to measure all the food you're picked to eat.

Step 2: Start by making small changes. Start by eating more vegetables in your diet for one month, then add another food group until you are used to eating the all the foods in diet list.

Step 3: Choose foods you like to eat from the list.

Step 4: Get in the habit of reading nutrition labels.

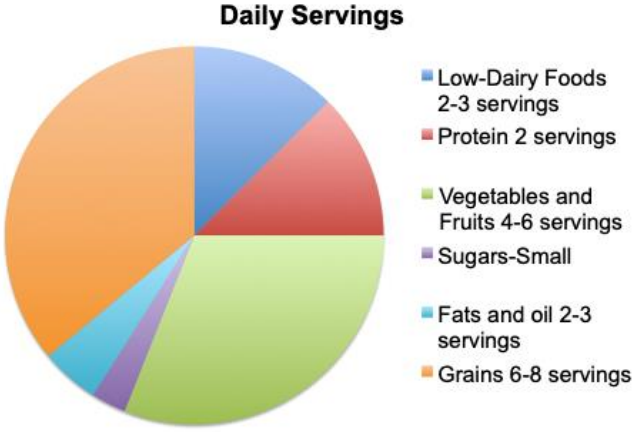
Step 5: Count your salt intake. Remember to count between 1500mg-2400mg

Daily Target Goals to Meet DASH Diet:

Nutrient	**DASH diet target**
Total fat (% kcal)	27
Saturated fat (% kcal)	6
Cholesterol (mg)	150
Protein (% kcal)	18
Fiber (g)	31
Magnesium (mg)	500
Calcium (mg)	1,240
Potassium (mg)	4,700
Sodium (mg)	2,400
Total Daily Calories	**2,100-2,300 calories**

Figure. Nutrients Daily Target Goals. Total daily goals for each nutrient (Lin et al., 2013)

****Medications drop your top number of your blood pressure by 10 to 15 points (Juraschek, Miller, Weaver, & Appel, 2017)**
****The DASH Diet drops your top number of your blood pressure by 5 to 21 points (Juraschek, Miller, Weaver, & Appel, 2017)**



How much you eat for each food group a day

Provider Instructions:_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

DASH Diet: Food Selections with Serving Limits

Food to choose in Food Groups	**Servings equivalent and Daily Goal**
Vegetables (max daily limit: 4 to 6 servings)	**Servings: Goal is to eat 4 to 6 servings**
1 cup of raw leafy vegetables	1
1/2 cup of chopped or cooked vegetables	1
Fruits	**Servings: Goal is to eat 4 to 6 servings**
1 medium size piece of fruit	1
Dairy-Low or Fat free (max daily limit: 2-3 servings)	**Servings: Goal is to eat 2 to 3 servings**
8 ounces of milk	1
1 cup of yogurt	1
1/2 ounces of cheese	1
Whole Grains (max daily limit: 6 to 8 servings)	**Servings: Goal is to eat 6 to 8 servings**
1 slice of bread	1
1 small size tortilla	1
1 ounces of dry cereal	1
1/2 cup of cooked rice	1
1/2 cup of pasta	1
1/2 cup of oatmeal	1
Meat (max daily limit: 2 servings)	**Servings: Goal is to eat 2 servings**
3 ounces (size of a deck of cards) of lean beef	1
3 ounces (size of a deck of cards) of lean chicken	1
3 ounces (size of a deck of cards) of fish	1
3 ounces (size of a deck of cards) of lean pork	1
Nuts, seeds, beans, legumes (max ONLY 5 DAYS PER WEEK: 1 servings)	**Servings: Goal is to eat 1 serving, 5 days only in a week**
1/3 cup of nuts	1
2 tablespoons of seeds	1
1/2 cup of dry beans	1
1/2 cup of split peas	
1/2 cup of dry lentils	
Fats and oils (max daily limit: 2 to 3 servings)	**Servings: Goal is to eat 2 to 3 servings**
1 teaspoon of vegetable oils	1
Salt (max daily limit: 1500mg to 2400mg)	**Goal is to eat 1500mg to 2400mg**
Total Daily Calories (max daily limit: 2100-2300 calories)	**Goal is to eat 2100 to 2300 calories**

APPENDIX D:

SYNTHESIS OF EVIDENCE: RESULTS AND EVIDENCE APPRAISAL

Evidence Appraisal

Project Question: In a local ambulatory care clinic in Tucson, AZ that manage the primary care of adults 18 years and older, what is the effectiveness of an evidence-based educational intervention for providers to educate patients on nutritional recommendations for proper management of hypertension?

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Baker, E. A., Barnidge, E. K., Schootman, M., Sawicki, M., & Motton-Kershaw, F. L. (2016). Adaptation of a modified dash diet to a rural African American community setting. *American Journal of Preventive Medicine, 51*(6), 967-974. doi:10.1016/j.amepre.2016.07.014	What is the effect of blood pressure when changing daily behaviors to incorporate the DASH diet within an African American community setting?	Johnson's Behavioral System Theory; focused on how researchers intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure.	Quasi-experimental cross-sectional cohort comparison study design	Between 2008 to 2013, rural African Americans age >=18 yrs old participated in culturally appropriate patient education on DASH diet in order to change dietary eating. It was a comparison between two Missouri rural African American counties, the interventional Pemiscot (n=395, 143 males, 252 females; mean age of 39 yrs old; perceived adequate income 67.8% at comfortable or have just enough, 31.9% do not have enough; 76.5% with at	Between 2008 to 2013 a program was rolled out to generally change the eating habits of rural African American population, comparing two county population in Missouri, USA. It was two countywide effort program where local farmers and grocery stores increased fruits and vegetables and created a program that pushed for eating for healthy foods by commercializing to eat more fruits and vegetables and less salt and fat. Participants in the study received DASH diet guidance and coaching from community health advocates to teach them how to eat	Interventional group experienced reduction of hypertensive and overweight/obese percentage of prevalence of participant population from baseline 61% hypertensive to post study result of 43.5%, and overweight/obese baseline of 69.8% to 62.8% ($p<0.01$). A mean reduction of -5mmHg SBP was the result to those who adhered to the DASH diet. Changes reflects the data report of participants who experienced the favorable changes increased intake of five or more servings of vegetables and fruits, consumed less salt and less fat when available food resources were more accessible or available

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				least GED/high school education and below; 23.5% have higher than high school education; and comparison Dunklin (n=391; 128 males; 264 females; perceived adequate income 63.5% with comfortable or have just enough, 36.6% do not have enough; 84.9% with GED/high school education or below, 14.9% with higher than a high school education) counties.	culturally appropriate foods that meets DASH diet eating pattern and servings target. Pre and post (of project) eating behavior of eating fruits and vegetables and eating less salt and fat data were collected using self-reported surveys and calculated as percentage of prevalence within the participant population. Pre and post blood pressure and weight and BMI data were collected, and calculated by prevalence percentage of participant population. Two categories of data were identified as percentage of participant population that are hypertensive (if reading were at least 140/90), and percentage of participant population who are overweight	to participants coupled with community health advisers. This study supported how there will be a reduction of blood pressure for hypertensive participants when they have a coach or community health advisor and available fruits and vegetables to guide them to adhere to DASH diet food selections and recommended servings target.

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					(BMI 25-29.9) or obese (BMI=30). Two counties were compared over time. T test and chi square was used to analyze pre and post measurements. Linear regression was used to determine predictors for hypertensive and BMI (demographic, participation, behavior predictors). Interaction term logistic regression was used to determine the two counties change of BMI and hypertensive percentage of prevalence of participants pre and post of the study. SAS version 9.2 were used for all calculations, $p<0.05$ was statically significant with 95% and 99% confidence intervals were calculated and	

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					included in the comparison.	
Corsino, L., Rocha-Goldberg, M. P., Batch, B. C., Ortiz-Melo, D. I., Bosworth, H. B., & Svetkey, L. P. (2012). The Latino health project: Pilot testing a culturally adapted behavioral weight loss intervention in obese and overweight Latino adults. *Ethnicity & Disease*, *22*(1), 51-7. PMID:22774309. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3395222/	What is the effect of changing daily dietary and exercise behaviors using motivational counseling for obese patients?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing diet counseling to participants assist change participants' behavior to choose a healthier diet that improves blood pressure control like the DASH diet.	Single-arm pretest-posttest observation pilot study design	A 20-week observation study of 56 Hispanic-only participants (40 from Mexico and 16 from Central and South American ethnicity), 47 females and 9 men, average age of 38 years old who lived in the United States for mean years of 12 years, received weekly group sessions, 90min to 2 hours using motivational interview counseling to change behaviors and incorporate the DASH diet, increase physical activity, and reduce food calorie consumption. Participants had to	A 20-week observation study of 56 Hispanic-only participants who received weekly group sessions, 90min to 2 hours using motivational interview counseling to change behaviors and incorporate the DASH diet, increase physical activity, and reduce food calorie consumption. Counselors used Spanish as the main language and DASH diet was encouraged by patient educating the components of the DASH diet and selecting foods most commonly consumed in Hispanic culture. Pre- and post-test measurements were used to analyze baseline and week 20 measurements of weight loss in lbs.,	Change from baseline to end of study measurements at week 20 resulted with average weight reductions of -5.1 lbs. ($p=0.006$), BMI 1.3 kg/m^2($p=0.002$), SBP -2.6mmHg ($p=0.013$). The study supported that participants with weekly motivational counseling who encouraged behavioral changes of incorporating DASH diet, increasing physical activity, reducing fat and food calorie intake were successful in reducing all outcomes measured. This study supported how behaviors can change with proper patient education by a counselor (motivational counselors), and was

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				have BMI of over >=25, overweight to obese (30 BMI >=30; 24 BMI >=25<30). 36 had some form of education, 0-12 grade, four vocational training, eight some college, five college educated, three unknowns.	BMI, dietary pattern, and SBP. Block food frequency questionnaire, Spanish version was used to analyze dietary pattern and adherence to DASH diet, and measured daily intake of vegetable servings per day, fruits, grains, meats, dairy, and fats. Height and weight was used to measure BMI, and the average of 3 blood pressure readings, manually taken, was used to measure SBP changes. All measurements used baseline and week 20 measurements to study the changes, and paired t test was used to calculate the findings. All statistics used E-Guide (SAS Institute, Cary, NC), and established p<0.5 as significant.	able to achieve healthy and favorable outcomes.

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Epstein, D. E., Sherwood, A., Smith, P. J., Craighead, L., Caccia, C., Lin, P.-H., … Blumenthal, J. A. (2012). Determinants and consequences of adherence to the dietary approaches to stop hypertension diet in African-American and White adults with high blood pressure: Results from the ENCORE trial. *Journal of the Academy of Nutrition & Dietetics, 112*(11), 1763-1773. https://doi.org/10.1016/j.jand.2012.07.007	What is the effect of blood pressure when White and African American patients adhere to the DASH diet and exercise regime compared to usual diet?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure.	Randomized controlled trial (RCT)	16-week diet and exercise modification trial randomized 144 participants in groups DASH diet alone group, DASH diet plus weight management group, and Usual Diet Control group. The adults were sedentary with body mass index between 25 to 39.9 (overweight, and obese respectively) with high SBP defined as 130 to 159 mm Hg and/or high DBP defined as 85 to 99 mm Hg. The 144 total participants mean age of 51 years old, specifically, Whites (n=88; 50 females, 38 males; average age of 54 years old), African Americans (n=56;	The following measurements were taken pre- and post-intervention implementation: clinical blood pressure (BP) taken four times before using the mean results using manual technique; ambulatory BP used Accutracker II (Suntech Medical Inc) ambulatory BP monitor programmed to record four BPs per hour during wake hours and twice per hour during sleep hours, and mean BP within 24 hours were evaluated; Parvo Medics TrueOne measurement system (model 2400, Parvo Medics) measured cardiorespiratory fitness. Dietary assessment was evaluated using DASH Adherence Score (1, 0.5, 0 points were awarded for meeting DASH diet	DASH diet with weight management group yielded the most favorable BP outcomes with 16.1 mmHg SBP reduction, 95% CI 13.0 to 19.2 mm Hg and 9.9 mmHg DBP reduction; 95% CI 8.1 to 11.6 mm Hg. DASH diet alone group yielded the second most favorable BP outcomes with 11.2 mmHg SBP reduction; 95% CI 8.1 to 14.3 mm Hg and 7.5 DBP reduction, 95% CI 5.8 to 9.3 mm Hg. The control group had a reduction but fewer than the other two interventions with 3.4 mmHg SBP reduction, 95% CI 0.4 to 6.4 mm Hg and 3.8 mmHg DBP reduction, 95% CI 2.2 to 5.5 mm Hg. DASH diet alone group had a DASH diet adherence score of mean=6.20, 95% CI 5.83 to 6.57. DASH diet with weight management group

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				47 females, 9 males; 49 years old).	food servings and food intake from 9 different nutrients; score range 0 to 9), Food Frequency Questionnaire, and 4-Day Food Diary. Psychological assessments were conducted to measure mental health stability and rule out mental barriers as a factor for treatment failure. Three groups (DASH alone; DASH with behavioral weight management; control group) were formed from randomly assigning the 144 qualified participants. DASH alone group had a weekly 30-45 mins group session led by a dietitian that consisted an introduction to DASH diet plan, goal setting, and action plans. DASH with behavioral weight management had a weekly 30-45 mins	had a DASH adherence score of mean=6.23; 95% CI 5.88 to 6.59. Control group resulted in less DASH adherence score with mean=3.66, 95% CI 3.30 to 4.01, *P*<0.0001. The study supported the correlation between DASH diet adherence and large SBP and DBP reductions outcomes (p<=0.01). Whites had a higher DASH adherence score with 5.83; 95% CI 5.50 to 6.11, p<0.001, compared to African Americans with 4.68; 95% CI 4.34 to 5.03, p<0.001. The essence of this study was the identification of the 9 nutrients measured in DASH adherence score, the positive correlation between the higher the adherence score the larger the BP reductions will result, and the importance of

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					group session led by a dietitian and a psychologist, and the curriculum that consisted with an introduction to DASH diet plan, goal setting, and action plans, calorie restriction plan, behavioral modification exercise plan of 30-45mins of aerobic exercise three times a week. The control group was planned to maintain they typical dietary pattern and exercise throughout the entire 16-week study period. Treatment groups were compared using general linear models on post-treatment adherence to the DASH diet. Possible predictors of post-treatment DASH adherence was assessed using linear regression model. ANCOVA was used to assess the	proper counseling or coaching by a healthcare provider will result in higher DASH adherence score that will yield a favorable BP outcome.

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					relationship of adherence to DASH and BP results. SAS version 9.2 (2008, SAS Institute) was used to calculate all statistical data for this trial.	
Gay, H. C., Rao, S. G., Vaccarino, V., & Ali, M. K. (2016). Effects of different dietary interventions on blood pressure: Systematic review and meta-analysis of randomized controlled trials. *Hypertension, 67*(4), 733-739. doi:10.1161/HYPERTENSIONAHA.115.06853	What are the effects on blood pressure when adults were on either the heart healthy DASH diets; Mediterranean diets; Low-sodium diets; low-sodium, high-potassium diets; low-sodium, low-calorie diets; low-calorie, low-fat diets?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure.	Systematic review and meta-analysis	From 24 RCTs trials published between January 1, 1990 and March 1, 2015, the selected trials studied how SBP and DBP were affected when over 23 858 participants were on heart healthy diets.	PubMed, EMBASE, and Web of Science databases were used to search for the selected 24 RCTs. The SBP and DBP net effect statistics between baseline readings and follow-up readings were taken from the intervention and control groups, and subtracting the baseline to follow-up readings to result the net changes. Statistics in the studies used p values from ANOVA methodology (0.5 assumption) and 95% confidence intervals for the mean difference to measure	All of the heart healthy diets identified in this systemic review and meta-analysis experienced a total net reduction only, which resulted in SBP reduction of −3.07 mm Hg and DBP reduction of −1.81 mm Hg. The following are the specific results that gave the calculation of total net reduction. The DASH diet participants had the largest net effect (total from all studies and calculated as net effect) compared to all the heart healthy diets, which resulted in SBP reduction calculation of −7.62 mm Hg (95%

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					the statistical significance, and calculating the standard deviations or the standard error from the p values and confidence intervals. Random effects model was used to account for the existence of heterogeneity between trials using I2 and Q statistics. Meta-regression analyses were managed using Comprehensive meta-analysis, version 3 (Biostat, Englewood, NJ), and all other analyses used Review Manager, version 5 (The Cochrane Collaboration, Copenhagen, Denmark).	CI, −9.95 to −5.29) and SBP reduction of −4.22 mm Hg (95% CI, −5.87 to −2.57). Mediterranean diet participants saw a mild net reduction that reported with SBP reduction of −1.17 mm Hg (95% CI, −2.81 to 0.46) and DBP reduction of −1.44 mm Hg (95% CI, −2.11 to −0.76). Low-sodium diet participants had net reduction of SBP −2.06 mm Hg (95% CI, −3.50 to −0.63) and DBP reduction of −1.30 mm Hg (95% CI, −2.37 to −0.23). Low-sodium, high-potassium diet participants had net reduction of SBP reduction of −3.14 mm Hg (95% CI, −6.27 to −0.02) and and DBP reduction of −2.01 mm Hg (95% CI, −3.40 to −0.62), while low-sodium, low-calorie diet participants had SBP reduction of −2.38 mm Hg (95%

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						CI, −3.79 to −0.98) and DBP reduction of −1.33 mm Hg (95% CI, −2.04 to −0.62). Low-calorie diets with low-fat components, had a SBP reduction of −3.18 mm Hg (95% CI, −4.24 to −2.11) and DBP reduction of −1.28 mm Hg (95% CI, −1.87 to −0.69).
Jarl, J., Tolentino, J. C., James, K., Clark, M. J., & Ryan, M. (2014). Supporting cardiovascular risk reduction in overweight and obese hypertensive patients through DASH diet and lifestyle education by primary care nurse practitioners. *Journal of the American Association of Nurse Practitioners*, *26*(9), 498-503. doi:10.1002/2327-6924.12124.	What is the effect of patient education and the participants' ability to adhere to the DASH diet when providers counsel about adhering to the DASH diet when comparing BMI changes pre and post intervention?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing diet counseling to participants assist change participants' behavior to choose a healthier diet that improves blood pressure control like the DASH diet.	Quasi-experimental pre and post intervention time-series study design	45 participants, n=26 (12 males 14 females; 16 Whites 10 Other race; 16 less than a college degree 10 college degree or higher; 13 employed and 13 unemployed) adhered to the diet change, n=19 (5 males 14 females; 8 Whites 11 Other race; 12 less than a college degree 7 college degree or higher; 10 employed 9 unemployed) did not adhere to diet change; average	In a 2-month period (September 7, 2011 to November 2, 2011), 45 hypertensive patients were given three group sessions and two 20 mins counseling phone calls on how to change eating patterns and adhere to the DASH diet (considered intervention of the study). Partners in Health (PIH)(Cronbach's alpha = 0.82; good internal consistency), 12 question survey that assessed patients'	Success rate of adhering to the DASH diet when intervention was implemented was 58%, n=26 and older individuals were more successful than the younger participants (avg age 58 years compared to avg age 51 years; p = .002). REAP score difference of 7 (57.5 to 64.5 improvement) were significant in supporting that participants who completed the studies were more knowledgeable and adhere more to DASH diet. PIH score also

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				age of 55 yrs old, and baseline BMI of 32.	behaviors related to self-management and understanding their chronic health condition, and Rapid Eating Assessment for Patients (REAP)(test–retest reliability ($r = .86$, $p < .0001$; excellent), 31 question survey, evaluated the lifestyle and diet factors pre- and post-intervention. All statistical calculations were done by SPSS for Windows, version 10 (SPSS Inc., Chicago, IL). Paired-samples t-test was performed on BMI, PIH, and REAP scores collected pre and post intervention. Frequencies and descriptive statistics and were calculated to describe patients' ability to manage their chronic medical condition, exercise and diet habits.	saw an increase to participants who adhered to DASH diet, yielding a PIH score improvement of 6.5, from 72.7 to 79.2. The PIH increase supported that among the participants who adhered to the DASH diet, post intervention gave them high perception that they are able to manage their chronic illnesses and learned valuable new knowledge about how to adhere to DASH diet. Between those who did not adhere completely to the DASH diet till end of study and those who completed them, 77% lost weight average of 3.6 lbs and BMI reduction of 1, from 32-31.5 to 31 BMI (paired t test calculation with $p< 0.001$). The significance of this study supported that when patients are given counseling

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						about the DASH diet, whether they are completely picking up on the dietary eating pattern 100% or partial, they will experience a reduction in BMI and weight.
Juraschek, S. P., IIIMiller, E. R., Weaver, C. M., Appel, L. J., & Miller, E. R., 3rd. (2017). Effects of Sodium Reduction and the DASH Diet in Relation to Baseline Blood Pressure. *Journal of the American College of Cardiology (JACC)*, *70*(23), 2841-2848. doi:https://doi.org/10.1016/j.jacc.2017.10.011	What is the systolic blood pressure (SBP) effect on diet that is low on sodium, or when DASH diet is incorporated, versus the control group of a high sodium diet?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure.	Randomized controlled trial with parallel and crossover design	412 participants, 57% women 43% men, and 57% were black 43% other race; 22 years of age and older with a mean age of 48 years old, who had baseline SBP readings of 130 mmHg, 130-139 mmHg, 140 to 149 mmHg, and >=150 mmHg. Excluded those who drank more than 14 alcoholic drinks a week; taking insulin or antihypertensive meds; diabetics; poorly controlled hyperlipidemic; diagnosed with heart disease/heart	Mean standard deviations were used to present the baseline SBP to compare baseline vs. after intervention effects (130 mmHg, 130-139 mmHg, 140 to 149 mmHg, and >=150 mmHg). Then, comparisons were between (first) low-sodium vs. high-sodium diet; (second) DASH diet (diet rich in vegetables, fruits, reduced in cholesterol and saturated fat, and low-fat dairy products) vs. high sodium diet; (third) low-sodium with DASH diet vs. high-sodium diet. The first comparison used	The study resulted with three comparative conclusions: observed the change from the four strata of SBP baseline with the effects of the control diet, observed the change from the four strata of SBP baseline with the effects of high sodium diet, and observed the change from the four strata of SBP baseline with the effects of low-sodium incorporated with DASH diet. In essence, the control diet, when sodium intake was reduced, resulted with SBP mean changes of −3.20 mmHg, −8.56 mmHg, −8.99 mmHg, and −7.04 mmHg from

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				failure; renal insufficiency. The trial was conducted between September 1999 through 1999 of which participants were randomized to DASH diet group or typical American diet group after a 2 week period of consuming a high-sodium diet. Once assigned to DASH or typical American diet, each participants ate a low-sodium diet (1500mg sodium diet at 2100 calories daily intake) for 30 days, then a 5-day wash out period where they ate their usual diet, then each participants within assigned groups then consumed a medium-sodium	crossover design to compare SBP at the end of the low-sodium intake period, against SBP at the end of high-sodium intake period with the same participants. These were analyzed using Huber and White robust variance estimator with generalized estimating equation regression models, and with the assumption that exchangeable working correlation existed. The second and third comparisons used parallel design that compared change in SBP baseline against the SBP at the end of each low or high sodium periods using linear regression model. A secondary analysis used DBP baseline measurements against end of period DBP measurements,	the baseline SBP readings of <130mmHg, 130 to 139mmHg, 140 to 149mmHg, and ≥150 mm Hg, respectively (pvalue trend = 0.004). In the aspect of high sodium diet, when DASH diet compared to control diet, the mean SBP changes were −4.5, −4.3, −4.7, and −10.6 mm Hg, from the baseline SBP readings of <130mmHg, 130 to 139mmHg, 140 to 149mmHg, and ≥150 mm Hg respectively (pvalue trend = 0.66). When DASH diet incorporated with low-sodium diet it resulted with SBP mean changes of −5.3mmHg, −7.5mmHg, −9.7mmHg, and −20.8 mmHg from the baseline SBP readings of <130mmHg, 130 to 139mmHg, 140 to 149mmHg, and ≥150 mm Hg, respectively

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				diet (2300 mg sodium diet at 2100 calories daily intake) for 30 days, then a 5 day wash out period, then each participants within assigned grouped then consumed a high-sodium diet (3450mg sodium diet at 2100 calories daily intake).	grouping the DBP baseline (<80mmHg, 80 to 84mmHg, 85 to 89mmHg, and ≥90 mm Hg). All analyses were calculated using Stata version 14.0 (Stata Corporation, College Station, Texas).	(pvalue trend <0.001). The secondary analysis of DBP readings yielded statistically significant mean changes compared with the primary SBP analysis. These results mean that incorporating low-sodium diet (1500mg sodium daily intake) intake with the DASH diet (diet rich in vegetables, fruits, reduced in cholesterol and saturated fat, and low-fat dairy products) reduced SBP for all types of patients (exclusions apply), especially those who were on the higher spectrum of SBP baseline. This was most evident when significant SBP reductions resulted in adults with SBP baseline of ≥150 mm Hg (highest levels observed). This study gave emphasis to the importance of incorporating low-

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						sodium daily intake with DASH diet to fully benefit from a significant reduction of SBP and gain meaningful blood pressure control.
Kucharska, A., Gajewska, D., Kiedrowski, M., Sińska, B., Juszczyk, G., Czerw, A., … Niegowska, J. (2018). The impact of individualised nutritional therapy according to DASH diet on blood pressure, body mass, and selected biochemical parameters in overweight/obese patients with primary arterial hypertension: a prospective randomised study. *Polish Heart Journal / Kardiologia Polska*, *76*(1), 158–165.	What is the effect on blood pressure, nutritional status, and selected biochemical measurements when nutritional intervention using the DASH diet (Dietary Approaches to Stop Hypertension) was implemented to overweight or obese patients with primary arterial hypertension?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure	Randomized controlled trial	126 participants, mean age of 55 to 60 years old (smoking samples of 17%; alcohol drinkers samples of 35%) randomized to be in DASH intervention group (DIG) (n=64) or in control group (n=62). For three months nutritional intervention was implemented in the DIG group (DIG was given individualized three month nutritional diet plan, three individual appointments that were four weeks apart in order to	SBP and DBP were taken using the auscultatory Korotkoff and sphygmomanometer method while participants were sitting down after 10 mins of rest, yielding a mean SBP/DBP after three consecutive measures, two mins apart were taken. Weight, height, and waist and hip circumferences were measured in accordance with World Health Organization guidelines with proper device calibrations before obtaining each measurement. Bioelectrical	The SBP comparison between baseline and intervention for the DIG group produced a reduction of -4.63mmHg (p=0.0) with a DBP reduction of -2.64 (p=0.0); control group's baseline to post intervention SBP comparison yielded a reduction of -0.84mmHg (p=1.0) with DBP increase of +1.74mmHg (p=0.09). The measurements for serum glucose, and insulin, leptin concentrations, body composition, height, weight, and waist and hip circumference had a significant more reduction in DIG group compared to the control group

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
doi:10.5603/KP.a2017.0184				adhere with intervention. Counselors were assigned to DIG, along with a lecture in groups of 4 to 6 patients about risk factors of hypertension, principles of the Dietary Approaches to Stop Hypertension (DASH) diet with emphasis on excessive weight reduction) and control group received standard recommendations. Blood pressure, serum glucose, and insulin, leptin concentrations, body composition, height, weight, and waist and hip circumference were measured at baseline and post intervention.	impedance methodology that used STA/BIA RJL — Akern 101/S (Italy) device at variable frequency current 5, 50, and 100 kHz. The rest of the biomarkers were taken per phlebotomy process. All measurements were taken at baseline and post intervention. All statistical analyses were calculated by Statistica v. 10.0 programme for Windows (Stat-Soft, Inc.). Kolmogorov-Smirnov test verified the normality of quantitative variables distribution, and Levene's test verified the homogeneity of variances. To compare quantitative variables between the DIG and control groups, Student's t-test was used, while other multiple data comparisons applied Bonferroni	($p<0.05$). This study presented the significance of how dietary behavioral changes will positively lower blood pressure, along with providing an overall healthy state. The relationship between patient and provider guided behavioral changes using DASH diet will provide favorable blood pressure control.

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					procedure. Pearson's correlation coefficient and stepwise regression analyses was used to determine the relationship between variables, and nominal variables was compared using $\chi 2$ test. $P<0.05$ was considered stats significant.	
Lima, S. T. R. M., da Silva Nalin de Souza, B., França, A. K. T., Filho, N. S., & Sichieri, R. (2013). Dietary approach to hypertension based on low glycaemic index and principles of DASH (Dietary Approaches to Stop Hypertension): a randomised trial in a primary care service. *British Journal of Nutrition, 110*(8), 1472-1479. doi:10.1017/S0007114513000718	What is the effect of DASH diet when incorporated in low-glycemic index Brazilian diet on blood pressure in adults?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure	Randomized controlled trial	156 participants were 20 years old and older were randomized using computer generated blocking system to either control group (n=72) or the experimental group (n=84), recruited between January 2010 and September 2011 from a list of hypertensive patients. Participants were followed in 6 months.	Nutritional analysis, which included dietary intake of designated diet type and amount that accounts for two weekdays and one weekend day, was performed by BRASIL-NUTRI software. Blood pressures were measured using Omron HEM-742INT model of which three measurements were taken and averaged them out for one result. Sodium intake was taken using 24 hour sodium and	In 6 months of intention to treat analysis of DASH diet that was incorporated in the low-glycemic index Brazilian diet resulted in reduction of SBP by 14.4 mm Hg and DBP by 9.7 mm Hg and a urinary sodium excretion reduction of 43.4 mEq/24hr in the experimental group, which had a greater reduction than the controlled group who received only salt intake restriction; SBP reduction of 6·7 mm Hg and DBP reduction

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					potassium exertion collection test that estimated 86% of total sodium was excreted in the urine, measured as mEq/l. Monthly anthropometric measurements were taken, along with food intake evaluations that were done in the 3rd month and at the 6th month. The experimental group also were counseled with specific DASH diet foods and serving amounts and principles of, which included sodium restriction, low-glycemic index foods, increased intake of fruits, vegetables, fish, whole grains, parboiled rice, beans and natural spices, high in potassium, magnesium, and fiber, as well as being low with saturated fat, total fat,	of 4-6 mm Hg. The experimental group also received servicing specific guidelines that contributed to significantly greater reduction of blood pressure. Specifically, three servings of five to nine servings of grains, four to five servings of vegetables, three to five servings of fruits, low-fat milk, one serving of legumes, potatoes-like foods, one to two servings of mainly fish and sparingly meat. All food was also to be eaten over five to six meals daily.

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					cholesterol, sweets and refined grains. SAS version 9.1 (version 9.1; SAS Institute, Inc.) were used to calculate all the statistical analyses. Shapiro-Wilk test was used initially, and the two groups were compared using Student's t test for continuous variables or Fisher's test for categorical data. A paired t test was used for urinary sodium and potassium excretion change comparisons of baseline versus post intervention data. Repeated-measures regression analyses using mixed models were used for blood pressure and weight data. Data results were statistically significant at 0.05 one-tailed level.	

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
Lin, P.-H., Yancy, W. S., Pollak, K. I., Dolor, R. J., Marcello, J., Samsa, G. P., … Svetkey, L. P. (2013). The Influence of a Physician and Patient Intervention Program on Dietary Intake. *Journal of the Academy of Nutrition & Dietetics*, *113*(11), 1465-1475. doi:https://doi.org/10.1016/j.jand.2013.06.343	What are the blood pressure effects when hypertensive patients were counseled by healthcare providers (physicians, dieticians, interventionist and community health advisors) towards healthy that meets the DASH diet standards, and engaged in lifestyle behavioral modifications?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure	Randomized controlled trial in a nested 2x2, double blind design	The study has 574 outpatient participants over the 18-month who were taken care of by 32 physicians. The average age of patients—60.6±11.1 years old, average body mass index—32.6±5.5, average systolic blood pressure—132.8±16.1 mm Hg, and diastolic blood pressure—73.8±11.1 mmHg. 62% women, 38% African American, self-reported adequate income, high school education and above, 96% were hypertensive. 16 physicians were assigned to physician intervention group who received two training modules that requires them to treat patients	At six-months and 18 months, patients were assessed, gathering the following information: weight, blood pressure. Diet intake measurements used Block Food Frequency Questionnaire (FFQ) (version 98.2), The Healthy Eating Index, dietary glycemic index and glycemic load, DSH score (a point system that awards pts 1, 0.5 or 0 indicating they met DASH diet nutrient target servings; 0 to 9 points range). 24hr urine test was used to assess dietary sodium intake (urine sodium levels), fruit and vegetable intake (potassium levels), protein (phosphorus levels). Analysis of covariance was used to assess the effects of patient intervention and physician intervention. To	Patients (pts) who received physician intervention resulted with SBP increase of +0.3 mm Hg (95% CI -1.5 to 2.2; *Pvalue*=0.72). Pts who received patient intervention resulted with SBP reduction of −2.6 mm Hg (95% CI −4.4 to −0.7; *P*=0.01). Those who received a combined physician plus patient intervention received the greatest positive effect on SBP, −9.7±12.7 mm Hg, *P*=0.03. Patient intervention had the highest weight reduction with -6.1lbs compared to physician intervention +0.6lbs, p<0.0001. Dietary analyses is as follows: pts who had physician intervention significantly increased carbohydrate , juices, fruits, potassium, and decreased fat intake with evidence of

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				using Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure hypertension management guidelines, lifestyle modification adherence, reduction of sodium intake, patient educate on DASH diet, weight loss and exercise management. The other 16 were physician control who did not receive instructions, only care as usual. Pts were assigned in pt intervention group and pt control group. Pt intervention group received lifestyle coaching led by	assess physician effect it compared dietary intake for patients who received physician intervention and patient intervention vs. patients who received physician intervention but with only patient control care; and then also compared those results against patients who received physician control care and patient intervention care vs. those who received physician control care with patient control care. Patient effects after intervention also compared dietary intake in the similar manner as the assessment for physician effect (comparing dietary intake to patients who received the randomized assigned group [intervention vs. control care]). All	improvement measured by Healthy Eating Index ($p<0.05$), with no significant improvement with DASH diet score. Pts who received patient intervention resulted in increased DASH diet score resulted 0.54 units ($p<0.0001$), and increased intakes (that met DASH diet requirements) of fiber ($P<0.001$), calcium ($P<0.05$), potassium ($P<0.05$), fruits and fruit juices ($P<0.001$), vegetables ($P<0.001$), dairy ($P<0.05$), carbohydrate ($P<0.05$) and urinary potassium excretion ($P<0.05$); decreased intakes were noticeable in energy from fat ($P<0.001$), sweets ($P<0.001$), saturated fat ($P<0.001$), total energy ($P<0.05$), dietary glycemic index ($P<0.05$), sodium ($P<0.05$), cholesterol ($P<0.001$), and fats/oils/sweets

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				dietitians and interventionists (including community health advisors) trained in motivational interviewing and experienced delivering lifestyle intervention and those who followed a structured guideline that encouraged lifestyle modifications in 20 week group sessions. Patients are to adopt the Dietary Approaches to Stop Hypertension (DASH) eating pattern, reduce sodium intake to <2400 mg/day, manage weight and track food and beverage intake for 4 days per week or more, and take blood	comparisons and change data used baseline measurements, which were gathered when patients were recruited. Spearman correlation analysis was used to assess the DASH score changes that may had been associated with blood pressure and weight changes. Significance was calculated with pvalue<= 0.05. All results were presented as average or mean with +- standard deviation and 95% confidence interval.	(P<0.001). Significant correlation existed between DASH score with SBP reduction changes (r=−0.10; P=0.02) and weight loss (r=−0.15; P=0.001). All of these significant changes were observed in the 6th month assessment; at 18th month assessment, measurements reverted back to baseline. The study was significant in terms of identifying indexes that measures quality of adherence to DASH diet by using the DASH score, and how significant engagement with lifestyle modification behaviors were able to adequately reduce SBP, which one can say that the manuals that were given to patients helped adhere to DASH diet and lifestyle modification while at home because they have it with them

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				pressure medications as prescribed, increase exercise to moderate exercise up to 180 minutes a week or more, and limit alcohol intake to to one drink per day for women and two for men, follow guideline book manuals with self-monitoring tools that gave importance to how and what activities to do to make effective lifestyle behavior modifications. Pts who assigned to patient control group received informational handouts on lifestyle modification for blood pressure control based on the Seventh Report of the Joint National		for references as needed.

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				Committee guidelines, a brief counseling session by lifestyle interventionists with dietitians, and a 6-week group sessions on lifestyle modifications.		
Ndanuko, R. N., Tapsell, L. C., Charlton, K. E., Neale, E. P., & Batterham, M. J. (2016). Dietary patterns and blood pressure in adults: A systematic review and meta-analysis of randomized controlled trials. *Advances in Nutrition, 7*(1), 76–89. doi:10.3945/an.115.009753	What is the effect of heart healthy diets, Mediterranean diet, Dietary Approaches to Stop Hypertension (DASH) diet, and Nordic diet, on blood pressure in adults?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure	Systematic review and meta-analysis	From the randomized controlled trials (RCT) published between January 01, 1999 and June 22, 2014, the selected studies investigated how the blood pressure was affected when samples were on heart healthy diets of either Mediterranean diet, Dietary Approaches to Stop Hypertension diet, and Nordic diet; 17 RCTs that involved 4212	Data systems Scopus, Web of Science, and MEDLINE were used to identify the selected 17 RCTs. The meta-analysis calculated the weighted the mean differences between the control groups and intervention, using the differences of systolic blood pressures and diastolic blood pressures. The mean differences were presented in terms of confidence intervals of 95%, and calculating the standard deviations of the mean change	The meta-analysis from 17 RCTs that investigated heart healthy diets supported that there was a significant reduction of systolic blood pressure (SBP) by 4.26 mm Hg and diastolic blood pressure (DBP) by 2.38 mm Hg. The DASH diet alone resulted with SBP reduction of 6.74 mm Hg SBP and DBP reduction of 3.59 mm Hg. The DASH diet mainly consisted of fruit and vegetables, low-fat dairy, whole grains, nuts, legumes, and seeds, with low

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				participants were studied	statistics and structural equation modeling, which all of the computations used the random-effects models that accounted for the sample population and the type of diet they were on. The χ2test and the I2 statistic calculated 75% heterogeneity, which was considered substantial. Cochrane Review Manager Software, RevMan Version 5.3 (The Cochrane Collaboration, Copenhagen) conducted all the statistical analyses.	intakes of meat and saturated fat, and reduced intake of dairy products and vegetables and fruit juices. The Nordic diet (Nordic origin such as whole grains, rapeseed oil, wild blue berries, fruits, vegetables, fish, nuts, and low-fat dairy products) produced reduction in both SBP and DBP as well, but not to a greater extend as DASH diet. Mediterranean diet (olive oil, high in plant foods such as whole-grain cereals, fresh fruits, vegetables, beans, nuts, seeds, and moderate amounts of dairy foods, fish, wine, and poultry and low amounts of red meat) produced 4.0-4.3 mm Hg SBP reduction and 1.9 DBP reduction. All of the diets studied controlled the sodium intake between 3000 mg/d to 2300 mg/d or less.

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
O'Connor, L. E., Li, J., Sayer, R. D., Hennessy, J. E., & Campbell, W. W. (2018). Short-Term Effects of Healthy Eating Pattern Cycling on Cardiovascular Disease Risk Factors: Pooled Results from Two Randomized Controlled Trials. *Nutrients*, *10*(11), 1725. doi:https://doi.org/10.3390/nu10111725	What is the effect on cardiovascular risk factors when healthy eating patterns was started, discontinued, then started again?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure	Retrospective crossover comparison of 2 Randomized controlled trials	19 participants with systolic blood pressure ≥120 mm Hg or diastolic blood pressure ≥80 mm Hg, 21–75 years old were recruited for the DASH diet study. 41 participants who were overweight or obese (25–37 kg/m2), 30–69 years old who had total cholesterol <260 mg/dL, LDL cholesterol <190 mg/dL, triglycerides <400 mg/dL, fasting glucose <110 mg/dL, systolic blood pressure <160 mm Hg, and diastolic blood pressure <100 mm Hg were recruited for the Mediterranean diet study. In total, n=60 Caucasian participants were	The participants in the DASH study were on the diet pattern for 6 weeks, while the Mediterranean study group was on the diet pattern for 5 weeks. Then, a 4-week wash period was instructed that allowed all participants to eat their pre study typical diet. Post wash out period involved the DASH and Mediterranean groups to resume their restricted diet for 6 and 5 weeks, respectively. Baseline and post intervention measurements were taken before starting the study and then after the 1st set of designated period, then again another baseline and post intervention measurements were taken after the wash out periods. The main outcomes were Fasting and ambulatory blood	Fasting SBP resulted with a reduction of −6 ± 1 mm Hg, p<0.05 for the 1st period for both groups, and with another reduction result of SBP −5 ± 1 mm Hg after the wash out period and after the 2nd period of the study for both groups. Total cholesterol also decreased with −19 ± 3 mg/dL, $p < 0.05$ after the 1st period of the study then decreased again after the wash out period and after 2nd period of the study period with −13 ± 3 mg/dL, $p <$ 0.05). Reduction were similar for ambulatory and fasting DBP and high-density lipoprotein cholesterol concentrations. Insulin and glucose had no significant changes throughout the study. Low-density lipoprotein cholesterol concentrations had a reduction of −13 ± 3 p= 0.020 after the 1st

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				in this study; 19 males, 41 females.	pressures (BP), fasting insulin, glucose, serum lipids, lipoproteins. SAS (SAS 9.4, SAS Institute Inc., Cary, NC, USA) was used to calculate mixed effects ANCOVA from both treatments and pre and post interventions. Results were presented as least squares (LS) mean ± SE of LS mean, with a two-tailed significance of $p<0.05$ with Bonferroni adjustment with each outcome measurements. The study was calculated with 80-95% power with n=60 with Cohen's d effect size of 0.4 for DASH group and 0.5 Mediterranean group for both sets of trial periods.	period of the study, but not as significant reduction after the 2nd period of the study with -6 ± 3, $p= 0.020$. The importance of this study revealed that patients will experience cardiovascular risk factor reductions when adopting DASH or Mediterranean healthy eating patterns, notably SBP and DBP with more significant benefits resulting from DASH diet eating pattern. Reductions were experienced when starting then stopping then restarting again, thus, it is important to continue to try changing eating behavior and engage in DASH diet even if failure ensues the first time.
Racine, E., Troyer, J., Warren-Findlow, J., & McAuley, W.	What is the effect of changing dietary eating patterns by	Johnson's Behavioral System Theory; focused on	Prospective Randomized	N=147 (n=73-62 females 12 males; 49 Whites 26	At baseline, participants completed a 24-hour	The intervention group, those who receive medical

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
(2011). The effect of medical nutrition therapy on changes in dietary knowledge and DASH diet adherence in older adults with cardiovascular disease. *Journal of Nutrition, Health & Aging*, *15*(10), 868-876. https://www.ncbi.nlm.nih.gov/pubmed/22159775	using medical nutrition therapy and adhering to DASH diet in adults with cardiovascular disease?	how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure	controlled trial study	Blacks;) interventional group who received 3 medical nutrition counseling by registered dietician in 12 months;(n=74-61 females 14 males; 51 Whites 24 Blacks) control group who only received DASH diet information during at baseline counseling) adults with mean age of 72.5 yrs old with hypertension and or hyperlipidemia.	dietary recall (Nutritionist ProTM dietary software.used to analyze this information) and a dietary knowledge questionnaire, and at 6 months, and then 12 months. T test was used to analyze diet knowledge and DASH diet adherence. Instrumental variable models with participant fixed effects were used to analyze the significance of medical nutrition therapy on dietary knowledge on DASH diet adherence and basic dietary knowledge.	nutrition therapy of 3 nutritional counseling, resulted with an increased on dietary knowledge from pre- to 12 months post study ($p<.01$). Changes in dietary knowledge were not associated with changes in DASH adherence from pre to post study ($p=0.44$). The significance of this study supported that adults, when counseled, even as low as three times per year, will be able to gain knowledge about DASH diet. Another significance of this study was the conclusion that knowledge gain was achieved with directions from a healthcare provider.
Salehi-Abargouei, A., Maghsoudi, Z., Shirani, F., & Azadbakht, L. (2013). Effects of dietary approaches	What is the effect of the DASH diet on preventing Coronary heart disease (CHD), Cardiovascular	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing	Systematic review and meta-analysis on observational prospective studies of cohort populations	Six qualified cohort studies between 2007 to 2011 with cohort population of over 259,984, between	Pubmed, ISI web of science, and EMBASE were used to select six qualified cohort studies between 2007 to	The meta-analysis from six cohort studies that investigated the effects of CVDs risks with those on DASH-type eat pattern, which

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
to stop hypertension (DASH)-style diet on fatal or nonfatal cardiovascular diseases--incidence: A systematic review and meta-analysis on observational prospective studies. *Nutrition, 29*(4), 611-618. https://doi.org/10.1016/j.nut.2012.12.018	diseases (CVD), heart failure (HF) and stroke?	DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus regular diet to lower blood pressure		the age 30 to 83 years old that included males and females.	2011 with cohort population of over 259,984. Inclusions consisted of studies with HF reporting relative risk (RR) and its 95% confidence limits or CHD, stroke, and DASH diet or DASH diet-like eating patterns. Log relative risk (RR) was calculated from RRs with 95% CI that compared incidents of CVDs, CHD, or stroke between groups with the highest and lowest scores of imitating DASH-type of eating pattern. Statistical heterogeneity in between studies was found by using subgroup analysis, and was assessed using I2 and Cochran's Q test. Sensitivity analysis was used, and over Begg's funnel plots were used to assess publication bias.	resulted with linear and negative association between DASH-type diet adherence and all CVDs. Based on this analyses being on Dash-type diet reduced the risk for developing CVDs by 20%, (RR = 0.80; 95% confidence interval [CI], 0.74–0.86; $P < 0.001$); CHD by 21% (RR = 0.79; 95% CI, 0.71–0.88; $P < 0.001$), stroke by 19% (RR = 0.81, 95% CI, 0.72–0.92; $P < 0.001$) and HF by 29% (RR= 0.71, 95% CI, 0.58–0.88; $P < 0.001$). The significance of this study revealed the importance of adhering to DASH diet or DASH type of diet because it has significant risk reduction effects against CVDs. Providers should patient educate their patients about DASH diet to protect them

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
					Egger's regression asymmetry test and Begg's adjusted rank correlation test were used to statistically assess funnel plot asymmetry. Linear trend between occurrence of CVDs and DASH-type diet score came from log RRs that was used in meta regression analysis. All statical analyses were calculated by STATA version 11.2 (STATA Corp, College Station, TX) with $p<0.05$ to be considered statistical significant.	against CVD to a certain point.
Saneei, P., Salehi-Abargouei, A., Esmaillzadeh, A., & Azadbakht, L. (2014). Influence of Dietary Approaches to Stop Hypertension (DASH) diet on blood pressure: A systematic review and meta-analysis	What is the effect of the DASH diet on blood pressure among adults?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing DASH diet to participants assist change participants' behavior to choose DASH dietary pattern versus	Systematic review and meta-analysis	17 RCTs from 1997 to 2013 with 2561 participants were included, of which 1747 participants had hypertension and 293 without hypertension, and interventions from 12 RCTs were dietary	Using PubMed, Scopus, Google scholar and ISI Web of Science database, a random effects meta-analysis and a systematic review was done, and found 17 qualified RCTs that investigated the effect of the DASH diet on blood	The meta-analysis of the 17 RCTs with 20 comparisons and 2561 participants supported the evidence of the DASH diet having had significant reduction of SBP by -6.74 mmHg (95%CI: −8.25, −5.23, $I2$ = 78.1%) and a DBP reduction of -3.54

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
on randomized controlled trials. *Nutrition, Metabolism & Cardiovascular Diseases, 24*(12), 1253-1261. doi:https://doi.org/10.1016/j.numecd.2014.06.008		regular diet to lower blood pressure		counseling/patient education, and the rest of the 5 RCTs had interventions that actually served DASH diet meals.	pressure with 2561 participants. The primary outcome measure were the mean changes of SBP and DBP (reported with their standard deviations and with 95% confidence intervals) when DASH diet vs control diets were studied. Also, using I2 and Cochran's Q-test, meta regression and subgroup analysis were performed to find sources of heterogeneity in between studies, and the heterogeneity of between-subgroups was evaluated through fixed effects model. Begg's funnel plot and Egger's test were used to assess publication bias, and sensitivity analysis was done to assess if any studies significantly affected the outcome measurement.	mmHg (95%CI: −4.29, −2.79, *I*2 = 56.7%). The SBP reductions in the studies ranged from −1.67 to −12.7 mmHg, and reduction of DBP were −1.20 to −10.20 mmHg. The meta regression for the mean baseline of SBP was 24% (Cochran's Q, P < 0.001, I2 = 78.1%), while the DBP was 49% (Cochran's Q, P < 0.001, I2 = 56.7%) of variance in between studies. These findings supported that the DASH diet had a greater SBP and DBP reduction degree for every unit that reported an elevated blood pressure (BP) (the higher the elevated BP reading the greater the reduction experienced when DASH diet was used) (p<0.001). This clearly supported that adherence to DASH diet will significantly

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
						reduce BP readings and lead to a better controlled BP. A better controlled BP will prevent hypertension and development of cardiovascular disease consequences.
Watowicz, R.P., Wexler, R.K., Weiss, R., Anderson, S.E., Darragh, A.R., & Taylor, C.A. (2019). Nutrition counseling for hypertension within a grocery store: An example of the patient-centered medical neighborhood model. *Journal of Nutrition Education Behavior, 51*(2), 129-137. doi:10.1016/j.jneb.2018.11.011	What is the effect of nutrition counseling for hypertensive patient?	Johnson's Behavioral System Theory; focused on how researchers' intervention of implementing diet counseling to participants assist change participants' behavior to choose a healthier diet that improves blood pressure control like the DASH diet	Single-arm pretest-posttest observation study design	A 12-week observation study of 21 participants who received DASH diet nutritional counseling by registered dieticians. Characteristics included mean age of 49 yrs old; 10 females 11 males; GED/high school up to post-graduate study as highest level of education; 9 African Americans, 9 Whites, and 3 other than African Americans and Whites. Participants were put on Diet	At baseline, participants completed a 24-hour dietary recall (Nutritionist ProTM dietary software.used to analyze this information) and a dietary knowledge questionnaire, and at 6 months, and then 12 months. T test was used to analyze diet knowledge and DASH diet adherence. Instrumental variable models with participant fixed effects were used to analyze the significance of medical nutrition therapy on dietary knowledge on DASH diet adherence and	Change from baseline to end of study measurements yielded HEI-2010 score mean increase of 10.9 points $P < .001$, meaning adherence to DASH diet for 12 weeks was achieved, noted 8 out of 12 food components had statistical significance of adherence by participants. No correlation was made between HEI-2010 score and change of SBP ($r = .19$; $P = .43$). Clinical significance yielded an average change of SBP from baseline to end of study week 12 measurement yielded reduction of –3.2 (SD, 15.9) mm Hg (95%

Author / Article	Quant: Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/Tools)	Findings
				Approach to Stop Hypertension diet and hypertensive medication was being taken by participants.	basic dietary knowledge.	confidence interval [CI], –4.2 to 10.6), but not statistically significant at p=0.38. The study supported that participants who were put on DASH diet and was given dietary counseling resulted with non-statistical significant but clinical significant reduced mean SBP measurement. 21 participants maintained eating the DASH diet and taking their hypertensive medications achieved lower SBP measurements.

APPENDIX E:

DISCLOSURE FORM

DISCLOSURE FORM

Introduction

My name is John Bryan Serrano from the University of Arizona. I am a doctorate of nursing practice student in a family nurse practitioner program. To meet the requirements of my doctorate of nursing practice degree, I am required to perform a quality improvement project.

Purpose of Project

The purpose of this project is threefold: (1) improve provider knowledge on the affects of diet on patients' blood pressures, and to use the DASH Diet prescription for patient counseling, (2) increase providers' intent to prescribe the dietary prescription, and (3) evaluate satisfaction with the content and delivery of this educational intervention. The goal is to increase compliance with evidence-based recommendations regarding prescribing dietary intervention to improve the management of patients' hypertensive blood pressures, including increasing patients' knowledge on how to appropriately select foods that prevent the development of hypertension.

Why are you being asked to participate?

You are being invited to participate in this project since you are healthcare providers that provide care for pre-hypertensive and hypertensive adult patients. I would like to determine if a brief educational presentation on how diet affects blood pressure and prescribing the DASH Diet prescription can increase your dietary prescribing practice and knowledge.

Description of the project:

This project involves a pre-test survey given prior to the brief educational presentation, and a post-test survey given immediately after the briefing. These surveys intend to assess knowledge base on hypertension and diet, and it includes several demographic questions, multiple-choice questions, rating scale questions, and an open-ended question to provide recommendations on how to improve the briefing and the dietary prescription presented. All data will be analyzed and reported back in a brief summary to the clinic to ensure no personal identifying information is exposed.

As for the brief educational presentation, it will take 10-15 minutes, and it will discuss the general affects of diet and blood pressure in the body, current guideline recommendations on hypertension, and prescribing the DASH Diet. Also, a dietary prescription hand-out template will be presented to you to aid your future practice of prescribing the DASH Diet.

The results of this project will:

1. Help us increase the understanding and bridge the knowledge gaps regarding how diet has a significant affect on blood pressures in the primary care setting.
2. Help us determine if a brief educational intervention can improve knowledge and increase prescribing of dietary interventions other than managing blood pressures with only pharmacological means.
3. Help improve the brief educational intervention to further increase its effectiveness for future use.

Are there any risks?

The risk of participating in this quality improvement project is minimal. The surveys are completely anonymous and only a brief summary of the findings will be provided. Also, this project is being reviewed by the University of Arizona Institutional Review Board and the Carondelet Medical Group-Central to be sure participants are protected.

What are the benefits?

The benefits of the study will be to improve primary care provider knowledge and increase prescribing practice with dietary prescriptions. Also, this project may indirectly improve patient care and outcomes by improving the management of patients' blood pressures.

The study is voluntary

By part taking in the educational presentation and completing the surveys, you are agreeing to participate in this quality improvement project. You may also decide not to participate at any time of the study.

Questions

If you have any questions or concerns, please contact John Bryan Serrano, MHA, BSN, RN-BC, FNP-DNP Student by email at johnbryan24@email.arizona.edu

APPENDIX F:

LETTER OF SUPPORT

May 30, 2019

University of Arizona
Human Subjects Protections Program
1615 E. Helen St.
P.O. Box 245137
Tucson, AZ 85724

Dear Human Subjects Protection Program Members:

This is to certify that John Bryan Sarmiento Serrano, MHA, BSN, RN-BC has permission to perform a quality improvement project entitled "Counseling Adults to Choose a Heart Healthy Diet to Appropriately Manage Hypertension in a Local Ambulatory Clinic in Tucson, Arizona," for partial fulfillment of the requirement for the Doctorate of Nursing Practice degree at the University of Arizona College of Nursing.

For this project, Mr. Serrano has permission to implement and evaluate a brief educational presentation for Carondelet Medical Group-Central clinic providers on the dietary effects on blood pressure and dietary prescription for management of hypertension, including use of a patient education and nutrition prescription tool.

This educational intervention is expected to be conducted at a medical staff meeting and will include quantitative pre and post survey tools for evaluation. The patient educational tool will be reviewed during this presentation.

Mr. Serrano has been granted full access to the clinical site to conduct this project, which is planned for Summer or Fall 2019, pending UA IRB review. This project will be physically conducted at the Carondelet Medical Group-Central located at 630 N. Alervnon Way, Suite 251, Tucson, AZ 85711.

I understand that Mr. Serrano will be conducting this project with IRB approval from the University of Arizona.

Sincerely,

Sarah Foley
Clinical Practice Manager
Carondelet Medical Group-Central

APPENDIX G:

INVITATION AND DISCLOSURE EMAIL

Invitation and Disclosure Email

*Email will be sent by the Clinical GPM to all primary care providers at Carondelet Medical Group-Central, Tucson, AZ.

Hi Everyone!

DASH (diet) YOUR WAY TO THE CONFERENCE ROOM!!!

The agenda for this month's medical staff meeting will consist of the regular clinic operation updates and news. Also, we have our student from University of Arizona, John Bryan Serrano, who will do a Powerpoint presentation and activity with you all about the DASH Diet. This is a quality improvement project on prescribing the DASH Diet as a dietary prescription for your patients in this ambulatory care clinic. Using your knowledge, experience and expertise, you will have the opportunity to help the student refine the dietary prescription. The activity will take about 20-30 minutes long. Attached is also the disclosure form for your review. So, please, support John by joining us on the third Tuesday of this month. There are a lot of information that will be shared to ultimately help our patients out! If you have any questions, please feel free to contact me or email John at
jbsserrano24@email.arizona.edu
Thank you, and I am looking forward to see you all there!

Location: Medical Staff Conference Room
Time: 12:00pm-12:30pm General agenda
12:30pm-1:00pm DASH Diet Presentation
Date: Third Thursday of the month aka Medical Staff Meeting day

Best,
Sarah Foley | Practice Manager
Carondelet Medical Group
630 N. Alvernon Way, Suite #251 | Tucson, AZ 85711
Main: 322-8460
Direct: 319-3268
Email: sarah.foley@carondelet.org

APPENDIX H:

EMAIL REMINDER: INVITATION TO STAFF PRESENTATION

Email Reminder: Invitation To Staff Presentation

*Email will be sent by the Clinical GPM to all primary care providers at Carondelet Medical Group-Central, Tucson, AZ.

Hi Everyone!

This is a reminder for all of you to…

DASH (diet) YOUR WAY TO THE CONFERENCE ROOM!!!

As a reminder, the agenda for this month's medical staff meeting will consist of the regular clinic operation updates and news. Also, we have our student from University of Arizona, John Bryan Serrano, who will do a Powerpoint presentation and activity with you all about the DASH Diet. This is a quality improvement project on prescribing the DASH Diet as a dietary prescription for your patients in this ambulatory care clinic. Using your knowledge, experience and expertise, you will have the opportunity to help the student refine the dietary prescription. The activity will take about 20-30 minutes long. Attached is also the disclosure form for your review. So, please, support John by joining us on the third Tuesday of this month. There are a lot of information that will be shared to ultimately help our patients out! If you have any questions, please feel free to contact me or email John at
jbsserrano24@email.arizona.edu
Thank you, and I am looking forward to see you all there!

Location: Medical Staff Conference Room
Time: 12:00pm-12:30pm General agenda
12:30pm-1:00pm DASH Diet Presentation
Date: Third Thursday of the month aka Medical Staff Meeting day

Best,
Sarah Foley | Practice Manager
Carondelet Medical Group
630 N. Alvernon Way, Suite #251 | Tucson, AZ 85711
Main: 322-8460
Direct: 319-3268
Email: sarah.foley@carondelet.org

APPENDIX I:

OUTLINE OF STAFF PRESENTATION

The Use of Patient Education Tool to prescribe the DASH Diet

I. Welcome participants
   a. review disclosure form
   b. begin by having them take the Pre-test
   c. collect pre-test in Manila folder, and lock them up

II. Patients, Hypertension, and The DASH Diet
   a. Background
      i. Leading cause of death
      ii. Prevalence of Hypertension
      iii. Money Spent: $320 billion annually
      iv. Local Patient statistics on hypertension
   b. Brief overview of Hypertension
      i. Cardiac output x systemic vascular resistance = blood pressure
      ii. Factors that change blood pressure
         1. Blood thickness
         2. Length of blood vessels
         3. Body systems' reaction and dynamic physiology
      iii. Current Guideline: 2017 ACC/AHA Hypertension definitions
         1. Normal
         2. Elevated
         3. Stage 1
         4. Stage 2
      iv. Sodium and water balance
         1. Water follows Sodium
         2. Increase Blood pressure
         3. Manage food we eat to manage blood pressure
      v. The DASH Diet
         1. Hypertension Guideline Recommendations
            a. 2017 ACC/AHA: recommendation on DASH
            b. Impact of DASH vs. other nonpharmacologicals
         2. What is the DASH Diet
            a. Definition of DASH Diet
            b. Nutrients: 10 components and its daily goals
            c. Emphasis eating variety of foods in food group
            d. 10 studies that support the DASH
            e. 5 studies on implementation: Handout & Coach
            f. What is Not DASH Diet
               i. More than just a low-salt diet
               ii. Focus on variety of food intake
            g. DASH Diet effects vs. medication effects on blood pressure
         3. Current Organizational handout
            a. Too cluttered
            b. Too wordy

c. Patients will probably not read

III. Dietary prescription Presentation
   a. Intentions of the handout
      i. Navigation is easy
      ii. Main point is to be a guide for patients to look at not read
      iii. Focus of consuming foods in it
      iv. Note calorie intake
      v. 1500mg vs. 2400mg of Sodium
      vi. Example of foods for each food groups and servings
      vii. Important to mention food servings goal
   b. Brief review of incorporating coding
      i. RVU review
      ii. Review of how providers can code for patient education counseling
      iii. Review how coding can increase their relative value unit
IV. Closing of presentation, and have them take post-test
   a. Collect post-test and lock them up
   b. Answer any questions

APPENDIX J:

THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD EXEMPTION REPORT

THE UNIVERSITY OF ARIZONA
Research, Discovery & Innovation

Human Subjects Protection Program

1618 E. Helen St.
P.O.Box 245137
Tucson, AZ 85724-5137
Tel: (520) 626-6721
http://rgw.arizona.edu/compliance/home

Date:	July 22, 2019
Principal Investigator:	John Bryan Serrano
Protocol Number:	1907813888
Protocol Title:	Counseling Adults to Choose a Heart Healthy Diet to Appropriately Manage Hypertension in a Local Ambulatory Clinic in Tucson, Arizona
Determination:	Human Subjects Review not Required

Documents Reviewed Concurrently:

HSPP Forms/Correspondence: *IRB Application Serrano, John Bryan Summer 2019.pdf*

Regulatory Determinations/Comments:

- Not Human Subjects Research as defined by 45 CFR 46.102(e): as presented, the activities described above do not meet the definition of research involving human subjects as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "Human subject means a living individual about whom an investigator (whether professional or student)conducting research: (i) Obtains information or biospecimens through intervention or interaction with the individual, and uses, studies, or analyzes the information or biospecimens; or (ii) Obtains, uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens. "
- Not Research as defined by 45 CFR 46.102(l): As presented, the activities described above do not meet the definition of research cited in the regulations issued by U.S. Department of Health and Human Services which state that "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research."

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPP) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the study activity. Please contact the HSPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

REFERENCES

Aspry, K. E., Van Horn, L., Carson, J. A. S., Wylie-Rosett, J., Kushner, R. F., Lichtenstein, A. H., … Kris-Etherton. (2018). Medical nutrition education, training, and competencies to advance guideline-based diet counseling by physicians. *Circulation, 137*, e821-e841. doi:10.1161/CIR.0000000000000563

Baker, E. A., Barnidge, E. K., Schootman, M., Sawicki, M., & Motton-Kershaw, F. L. (2016). Adaptation of a modified dash diet to a rural African American community setting. *American Journal of Preventive Medicine*, *51*(6), 967-974. doi:10.1016/j.amepre.2016.07.014

Butts, J. B. & Rich, K. L. (2018). *Philosophies and theories: For advanced nursing practice* (3rd Ed.). Burlington, MA: Jones & Barlett Learning.

Carey, R. M., Muntner, P., Bosworth, H. B., & Whelton, P. K. (2018). Prevention and control of hypertension. *Journal of the American College of Cardiology*, *72*(11), 1278-1293. doi:https://doi.org/10.1016/j.jacc.2018.07.008

CDC, Centers for Disease Control and Prevention. (2011). *Introduction to program evaluation for public health programs. A self-study guide.* Atlanta, GA: Centers for Disease Control and Prevention. Retrieved from: https://www.cdc.gov/eval/guide/cdcevalmanual.pdf

Chobanian, A. V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo, J. L., … Roccella, E. J. (2003). National heart, lung, and blood institute joint national committee on prevention, detection, evaluation, and treatment of high blood pressure; National high blood pressure education program coordinating committee. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: The JNC 7 report.. *Journal of American Medical Association, 289* (19), 2560-2572. doi:10.1001/jama.289.19.2560

Corsino, L., Rocha-Goldberg, M. P., Batch, B. C., Ortiz-Melo, D. I., Bosworth, H. B., & Svetkey, L. P. (2012). The Latino health project: Pilot testing a culturally adapted behavioral weight loss intervention in obese and overweight Latino adults. *Ethnicity & Disease*, *22*(1), 51-57. PMID: 22774309. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3395222/

Epstein, D. E., Sherwood, A., Smith, P. J., Craighead, L., Caccia, C., Lin, P.-H., … Blumenthal, J. A. (2012). Determinants and consequences of adherence to the dietary approaches to stop hypertension diet in African-American and white adults with high blood pressure: Results from the encore trial. *Journal of the Academy of Nutrition & Dietetics*, *112*(11), 1763-1773. https://doi.org/10.1016/j.jand.2012.07.007

Gay, H. C., Rao, S. G., Vaccarino, V., & Ali, M. K. (2016). Effects of different dietary interventions on blood pressure: Systematic review and meta-analysis of randomized controlled trials. *Hypertension, 67*(4), 733-739. doi:10.1161/HYPERTENSIONAHA.115.06853

Ghanbari, A. & Pouy, S. (2018). Designing nursing care program based on Johnson behavioral model in children with acute lymphoblastic leukemia: A case study. *International Journal of Caring Sciences, 11*(1), 631-638. http://www.internationaljournalofcaringsciences.org/docs/74_poy_casestudy_11_1.pdf

Gonzalo, A. (2014). Dorothy Johnson: Behavioral system model. *Nurseslabs.* Retrieved from https://nurseslabs.com/dorothy-e-johnsons-behavioral-system-model/

HHS, U.S. Department of Health & Human Services. (2018). The Belmont report: Office of the Secretary: Ethical principles and guidelines for the protection of human subjects of research: The national commission for the protection of human subjects of biomedical and behavioral research. *Office for Human Research Protections, U.S. Department of Health & Human Services.* Retrieved from https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/read-the-belmont-report/index.html

Institute of Medicine. (2004). Dietary reference intakes for water, potassium, sodium, chloride, and sulfate, 1st (ed.). Washington, DC: National Academies Press.

Jackson, S. L., King, S. M., Zhao, L., & Cogswell, M. E. (2016). *Prevalence of excess sodium intake in the United States* (NHANES, 2009-2012). *MMWR, Morbidity & Mortality Weekly Report, 64*(52), 1393-1397. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6452a1.htm

James, P. A., Oparil, S., Carter, B. L., Cushman, W. C., Dennison-Himmelfarb, C., Handler, J., … Ortiz, E. (2014). 2014 Evidence-based guidelines for the management of high blood pressure in adults: Report from the panel members appointed to the eighth joint national committee (jnc 8). *Journal of American Medical Association*, 311(5), 507-520. doi:10.1001/jama.2013.284427

Jarl, J., Tolentino, J. C., James, K., Clark, M. J., & Ryan, M. (2014). Supporting cardiovascular risk reduction in overweight and obese hypertensive patients through DASH diet and lifestyle education by primary care nurse practitioners. *Journal of the American Association of Nurse Practitioners, 26*(9), 498-503. doi:10.1002/2327-6924.12124.

Johnson, D. E. (1980). *The behavioral system model for nursing*. In J. Riehl, & C. Roy (Eds.), *Conceptual models for nursing practice* (2nd ed.). New York, NY: Appleton-Century-Crofts.

Johnson, D. E. (1990). *The behavioral system model for nursing*. In M. E. Parker (Ed.), *Nursing theories in practice*. New York, NY: National League for Nursing.

Juraschek, S. P., Miller III, E. R., Weaver, C. M., & Appel, L. J., (2017). Effects of sodium reduction and the dash diet in relation to baseline blood pressure. *Journal of the American College of Cardiology (JACC), 70*(23), 2841-2848. doi:https://doi.org/10.1016/j.jacc.2017.10.011

Kucharska, A., Gajewska, D., Kiedrowski, M., Sińska, B., Juszczyk, G., Czerw, A., … Niegowska, J. (2018). The impact of individualised nutritional therapy according to DASH diet on blood pressure, body mass, and selected biochemical parameters in overweight/obese patients with primary arterial hypertension: A prospective randomised study. *Polish Heart Journal / Kardiologia Polska*, *76*(1), 158-165. doi:10.5603/KP.a2017.0184

LeMone, P. & Burke, K. (2008). *Medical-surgical nursing: Critical thinking in client care.* Upper Saddle, NJ: Pearson Prentice Hall.

Leviton, L.C., & Melichar, L. (2016). Balancing stakeholder needs in the evaluation of healthcare quality improvement. *BMJ Quality & Safety*, *25*(10), 803-807. doi:10.1136/bmjqs-2015-004814

Lewington, S., Clarke, R., Qizilbash, N., Peto, R., Collins, R., & Prospective Studies Collaboration. (2002). Age-specific relevance of usual blood pressure to vascular mortality: A meta-analysis of individual data for one million adults in 61 prospective studies. *[Published correction appears in Lancet 2003, 361,* 1060. doi:10.1016/S0140-6736(03)13061-9*]*. *Lancet 2002*, *360*(9349), 1903-1913. doi:https://doi.org/10.1016/S0140-6736(02)11911-8.

Lima, S. T. R. M., da Silva Nalin de Souza, B., França, A. K. T., Filho, N. S., & Sichieri, R. (2013). Dietary approach to hypertension based on low glycaemic index and principles of DASH (dietary approaches to stop hypertension): A randomised trial in a primary care service. *British Journal of Nutrition, 110*(8), 1472-1479. doi:10.1017/S0007114513000718

Lin, P.-H., Yancy, W. S., Pollak, K. I., Dolor, R. J., Marcello, J., Samsa, G. P., … Svetkey, L. P. (2013). The influence of a physician and patient intervention program on dietary intake. *Journal of the Academy of Nutrition & Dietetics*, *113*(11), 1465-1475. doi:https://doi.org/10.1016/j.jand.2013.06.343

Loveland-Cherry, C. J. & Wilkerson, S. A. (1989). *Dorothy Johnson's behavioral system model*. In J. J. Fitzpatrick & A. L. Whall (Eds.), *Conceptual models of nursing* (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.

McCance, K. L. & Huether, S. E. (2014). *Pathophysiology: The biologic basis for disease in adults and children*. St. Louis, MO: Mosby, Elsevier, Inc.

Motulsky, H. (2014). Intuitive biostatistics: A non mathematical guide to statistical thinking. New York, NY: Oxford University Press

Mozaffarian, D., Benjamin, E. J., Go, A. S., Arnett, D. K., Blaha, M. J., Cushman, M., … Turner, M. B., American Heart Association, & Stroke Statistics Subcommittee. (2016). Statistics committee heart disease and stroke statistics-2016 update: A report from the American heart association. *Circulation, 133*(4), e38-e360. doi:10.1161/CIR.0000000000000350

Murphy, S. L., Kochanek, K. D., Xu, J. Q., & Arias, E. (2015). *Mortality in the United States, 2014* (NCHS data brief, no 229). Hyattsville, MD: National Center for Health Statistics.

Ndanuko, R. N., Tapsell, L. C., Charlton, K. E., Neale, E. P., & Batterham, M. J. (2016). Dietary patterns and blood pressure in adults: A systematic review and meta-analysis of randomized controlled trials. *Advances in Nutrition, 7*(1), 76-89. doi:10.3945/an.115.009753

O'Connor, L. E., Li, J., Sayer, R. D., Hennessy, J. E., & Campbell, W. W. (2018). Short-term effects of healthy eating pattern cycling on cardiovascular disease risk factors: Pooled results from two randomized controlled trials. *Nutrients, 10*(11), 1725. doi:https://doi.org/10.3390/nu10111725

ODPHP, Office of Disease Prevention and Health Promotion. (2019). Heart disease and stroke. *HealthyPeople.gov, Healthy People 2020, U.S. Department of Health and Human Services*. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/heart-disease-and-stroke

Petiprin, A. (2016a). Dorothy Johnson - Nursing theorist: Dorothy Johnson's contribution to nursing: Behavioral system model. *Nursing-Theory.org*. Retrieved from http://www.nursing-theory.org/nursing-theorists/Dorothy-E-Johnson.php

Petiprin, A. (2016b). Health behavioral theory. *Nursing-Theory.org*. Retrieved from http://www.nursing-theory.org/theories-and-models/johnson-behavior-system-model.php

Poster, E. C. & Beliz, L. (1992). The use of the Johnson Behavioral system model to measure changes during adolescent hospitalization. *International Journal of Adolescence and Youth, 4*, 73-84. doi:10.1080/02673843.1992.9747724

Poster, E. C., Dee, V., & Randell, B. P. (1997). The Johnson behavioral systems model as a framework for patient outcome evaluation. *Journal of the American Psychiatric Nurses Association, 3*(3), 73-80. doi:https://doi.org/10.1177/107839039700300304

Racine, E., Troyer, J., Warren-Findlow, J., & McAuley, W. (2011). The effect of medical nutrition therapy on changes in dietary knowledge and dash diet adherence in older adults with cardiovascular disease. *Journal of Nutrition, Health & Aging, 15*(10), 868-876. https://www.ncbi.nlm.nih.gov/pubmed/22159775

Reeves, S., Pelone, F., Harrison, R., Goldman, J., & Zwarenstein, M. (2017) Interprofessional collaboration to improve professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews, 6,* Art. No.: CD000072. doi:10.1002/14651858.CD000072.pub3.

Ritchey, M. D., Wall, H. K., Gillespie, C., George, M. G., Jamal, A., Division for Heart Disease and Stroke Prevention, CDC (2014). Million hearts: prevalence of leading cardiovascular disease risk factors--United States, 2005-2012. *MMWR. Morbidity and Mortality Weekly Report, 63*(21), 462-467. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5779465/

RWJF, Robert Wood Johnson Foundation. (2018). *Hypertension in the United States*. The State of Obesity: Better Policies for a Healthier America, Robert Wood Johnson Foundation. Retrieved from https://stateofobesity.org/hypertension/

RWJF, Robert Wood Johnson Foundation. (2018). *The state of obesity in Arizona*. The State of Obesity: Better Policies for a Healthier America, Robert Wood Johnson Foundation. Retrieved from https://stateofobesity.org/states/az/

Sacks, F. M., Svetkey, L. P., Vollmer, W. M., Appel, L. J., Bray, G. A., Harsha, D.,…, Lin, P. H., DASH-Sodium Collaborative Research Group. (2001). Effects of blood pressure or reduced dietary sodium and the dietary approaches to stop hypertension (DASH) diet. *New England Journal of Medicine, 344*(1), 3-10. doi:10.1056/NEJM200101043440101

Salehi-Abargouei, A., Maghsoudi, Z., Shirani, F., & Azadbakht, L. (2013). Effects of dietary approaches to stop hypertension (DASH)-style diet on fatal or nonfatal cardiovascular diseases--Incidence: A systematic review and meta-analysis on observational prospective studies. *Nutrition, 29*(4), 611-618. https://doi.org/10.1016/j.nut.2012.12.018

Saneei, P., Salehi-Abargouei, A., Esmaillzadeh, A., & Azadbakht, L. (2014). Influence of dietary approaches to stop hypertension (DASH) diet on blood pressure: A systematic review and meta-analysis on randomized controlled trials. *Nutrition, Metabolism & Cardiovascular Diseases, 24*(12), 1253-1261. doi:https://doi.org/10.1016/j.numecd.2014.06.008

UWPHI, University of Wisconsin Population Health Institute. (2018). *County health: Rankings & roadmaps: Building a culture of health, county by county: Arizona 2018, Pima (pi)*. University of Wisconsin Population Health Institute, School of Medicine and Public Health, Robert Wood Johnson Foundation, County Health Rankings. Retrieved from http://www.countyhealthrankings.org/app/arizona/2018/rankings/pima/county/outcomes/overall/snapshot

Watowicz, R. P., Wexler, R. K., Weiss, R., Anderson, S. E., Darragh, A. R., & Taylor, C. A. (2019). Nutrition counseling for hypertension within a grocery store: An example of the patient-centered medical neighborhood model. *Journal of Nutrition Education Behavior, 51*(2), 129-137. doi:10.1016/j.jneb.2018.11.011

Whelton, P. K., Carey, R. M., Aronow, W. S., Casey, D. E., Collins, K. J., Himmelfarb, C. D., … Wright, J. T. (2018). 2017 ACC /AHA /AAPA /ABC/ ACPM/ AGS/ APhA/ ASH/ ASPC/ NMA/ PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: A report of the American college of cardiology/American heart association task force on clinical practice guidelines. *Hypertension, 71*(6), e13-e115. doi:10.1161/HYP.0000000000000065

Yoon, S. S., Fryar, C. D., & Carroll, M. D. (2015). *Hypertension prevalence and control among adults: United States, 2011-2014* (NCHS data brief, no 220). Hyattsville, MD: National Center for Health Statistics.

Yoon, S. S., Gu, Q., Nwankwo, T., Wright, J. D., Hong, Y., & Burt, V. (2014) Trends in blood pressure among adults with hypertension: United States, 2003 to 2012. *Hypertension, 65*, 54-61. doi:https://doi.org/10.1161/HYPERTENSIONAHA.114.04012